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ABSTRACT

This report on effective programs for children updates the 1988 report by providing new and stronger documentation of the programs' benefits and cost effectiveness. Eight programs and types of programs are discussed in Part I and four program areas that warrant attention are discussed in Part II. Part I reports on: (1) the Special Supplemental Food Program for Women, Infants, and Children; (2) prenatal care; (3) Medicaid; (4) childhood immunization; (5) preschool education; (6) compensatory education; (7) education of children with disabilities; and (8) employment and training. For each program or program type, abstracts of cited studies are included, the program in question is described, program benefits are delineated, and charts concerning participation in programs are included. Part II reports on childhood injury prevention; lead screening and reduction; smoking cessation programs for pregnant women; and home visiting. For each topic, the problem in question, and strategies and programs for dealing with the problem, are discussed. Studies concerning these strategies and programs are cited and abstracted. Material on childhood injury prevention includes charts of injury-related deaths among children and youths. An appendix lists sources of program participation data. Statements of additional minority views and dissenting views conclude the report. (RH)

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101st Congress
2d Session

HOUSE OF REPRESENTATIVES

Report
101-1000

OPPORTUNITIES FOR SUCCESS: COST-EFFECTIVE PROGRAMS FOR CHILDREN, UPDATE, 1990

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REPORT

TOGETHER WITH

ADDITIONAL MINORITY VIEWS

AND

DISSENTING VIEWS

OF THE

SELECT COMMITTEE ON CHILDREN, YOUTH, AND FAMILIES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

December 21, 1990.—Pursuant to House Resolution 84, referred jointly to the Committees on Education and Labor, Energy and Commerce, and Ways and Means and ordered to be printed

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LETTER OF TRANSMITTAL

SELECT COMMITTEE ON CHILDREN, YOUTH, AND FAMILIES,
Washington, DC, December 21, 1990.

Hon. DONNALD K. ANDERSON,
Clerk, House of Representatives, Washington, DC.

DEAR MR. ANDERSON: We are pleased to transmit the enclosed four reports entitled "Report on the Activities for the Year 1989 of the Select Committee on Children, Youth, and Families, 101st Congress, First Session," "Federal Programs Affecting Children and Their Families, 1990," "Opportunities for Success: Cost-Effective Programs for Children, Update, 1990," and "Respite Care: A Listing of Resources."

These documents are transmitted in accordance with Title II, Section 206(a) of H. Res. 84, and, in addition to reports entitled "U.S. Children and Their Families: Current Conditions and Recent Trends, 1989," "No Place to Call Home: Discarded Children in America," and "Children's Well-Being: An International Comparison" which were submitted earlier, summarize some of the major findings of the Committee during the First and Second Sessions of the 101st Congress.

A final document, "Activities Report for the Year 1990 of the Select Committee on Children, Youth, and Families, 101st Congress, Second Session," will follow.

Respectfully submitted.

Sincerely,

GEORGE MILLER,
Chairman.

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* * * *

UPDATE OF FEDERAL PROGRAMS INCLUDED IN THIS REPORT: Since Committee approval of this report in October 1990, legislation was signed into law reauthorizing **Head Start** (P.L. 101-501), **Individuals with Disabilities Education** Act [previously known as the Education of the Handicapped Act] (P.L. 101-476), and the **Childhood Immunization Program** (P.L. 101-502). **Medicaid** expansions for children were also signed into law (P.L. 101-508). The following programs received increases in FY 1991 appropriations (over FY 1990) that will increase participation to varying degrees: The **Special Supplemental Food Program for Women, Infants, and Children (WIC)** (P.L. 101-506), **Head Start, Individuals with Disabilities Education Act, Compensatory Education for the Disadvantaged, Job Corps, Maternal and Child Health Block Grant, Community and Migrant Health Centers**, the **Childhood Immunization Program**, and **Lead Screening and Prevention** (P.L. 101-517).

101st Congress
2d Session

HOUSE OF REPRESENTATIVES

Report
101-1000

OPPORTUNITIES FOR SUCCESS: COST-EFFECTIVE PROGRAMS FOR CHILDREN, UPDATE, 1990

December 21, 1990.—Pursuant to House Resolution 84, referred jointly to the Committees on Education and Labor, Energy and Commerce, and Ways and Means and ordered to be printed

Mr. Miller of California, from the Select Committee on Children, Youth, and Families, submitted the following

REPORT

together with

ADDITIONAL MINORITY AND DISSENTING VIEWS

OPPORTUNITIES FOR SUCCESS:

COST-EFFECTIVE PROGRAMS FOR CHILDREN

UPDATE, 1990

INTRODUCTION

In 1985 and in 1988, the Select Committee on Children, Youth, and Families issued comprehensive reports on the success and cost effectiveness of eight major areas of Federal programming that promote the health, development, nutrition and well-being of the nation's children and their families. Those reports highlighted compelling research evidence that key interventions make critical and dramatic improvements in the lives of millions of children in this country, while significantly reducing the need for costly expenditures for years to come.

The evidence continues to mount, and government, business and academic leaders from all sectors of the nation have taken up the call to invest in these effective and cost-saving efforts.

> ...[E]arly intervention is the best opportunity to break the cycle of poverty. There is solid evidence that Federal programs such as Head Start, prenatal care, immunization, the Women, Infants and Children's Feeding Program and compensatory education do work....
>
> Former Presidents Gerald Ford and
> Jimmy Carter, American Agenda, 1988

> It is less costly to society and to individuals to prevent early failure through efforts directed toward parents and children alike from prenatal care through age 5....
>
> Committee for Economic Development,
> Children in Need, 1987

> We can fulfill our responsibilities to the next generation and maintain our competitive posture in the worldwide economy only if today's children become healthy, productive adults. This requires that children have adequate health care during their early years, giving them a proper foundation for succeeding in their education.
>
> David Packard, Board Chairman,
> Hewlett-Packard Co.,
> Washington Post, September 29, 1990

Other nations have managed to retain their competitive edge and still protect the health and well-being of their children. Recent Select Committee investigations have documented that several Western industrialized nations have significantly higher childhood immunization rates among their preschool-age children, lower child mortality rates due to injury, and lower low birthweight and infant mortality rates than the United States.

Since the last update of this report in 1988, progress has been made to reach the unserved. Incremental Medicaid expansions, for example, have enabled more low-income women to receive early prenatal care. Despite the support and the evidence, these proven programs still fail to reach millions of eligible children and families; 80% of eligible children are denied Head Start and seven million children do not have access to routine, preventive health care. Some childhood illnesses are on the increase, accompanied by the shrinking reach and rising costs of vaccines for major childhood diseases.

With this edition, the Committee updates the growing base of research on these eight programs with new and even stronger documentation of their benefits and cost effectiveness.

Also with this edition, the Committee details four additional program areas which now warrant our attention. Since our earlier reviews, research on "childhood injury prevention," "lead screening and reduction efforts," "smoking cessation programs for pregnant women," and "home visiting" efforts, has increased and provides significant evidence of effectiveness. Although Federal support of these interventions has tended to be smaller and less direct than the eight core programs highlighted in the past, growing evidence regarding their effectiveness support including them as important strategies for public and private sector action.

In 1988, we noted that family preservation efforts and community-based family support efforts had begun to demonstrate significant success and cost-effectiveness. While this review found that research in these areas has grown and outcomes continue to look promising, results await more vigorous documentation, underscoring the need for additional investigation. In addition, this review revealed the significant program benefits of respite care programs that provide relief to families caring for an individual with special needs, and child nutrition programs that improve nutritional intake and reduce undernutrition. However, since these efforts have not been evaluated strictly for the cost savings they effect, we defer including them.

We acknowledge the methodological limitations present in evaluating social programs. However, it is extremely important to evaluate publicly supported programs and, for that reason, to develop the very best evaluation methods possible. In addition to enhancing our understanding of their impact on children and their budgetary implications, evaluations help us improve program design and delivery. The research reviewed in this study relies on the best methodologies available.

In the face of mounting budget crises, we must maintain a long-term view of social investment. If America is to remain fiscally sound and economically competitive, then educational, health and social deficits among our children cannot be tolerated.

> There is no more important contradiction in social policy than this: From child development research we now know that the first few years of life play a crucial role in shaping a person's lifelong mental, emotional, and physical abilities. And yet it is for this stage of life that we seem to make our social investments most grudgingly and tolerate the greatest deprivation....Although scientific knowledge about early childhood years has mushroomed, it is during these years that Americans are most likely to live in poverty. Simply put, our knowledge is not being applied.
>
> The Ford Foundation Project on Social
> Welfare and the American Future,
> The Common Good, 1989

The evidence presented in this report is a further reminder that we have the knowledge to produce a productive labor force, as well as stable families and healthy children in the 21st century. It should prove an invaluable document for use by researchers, service providers and policymakers in responding to the urgent needs of children and families.

(Signed)

GEORGE MILLER,
Chairman
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HIGHLIGHTS OF PROGRAM EFFECTS

HIGHLIGHTS OF PROGRAM EFFECTS

	BENEFITS FOR CHILDREN	COST BENEFIT	SCOPE/PARTICIPATION
WIC – SPECIAL SUPPLEMENTAL FOOD PROGRAM FOR WOMEN, INFANTS AND CHILDREN	Reduction in infant mortality and births of low birthweight infants; reduced prevalence of anemia; improved cognitive skills	$1 investment in prenatal component of WIC has saved as much as $3 in short-term hospital costs, as much as $3.13 in Medicaid costs for newborns and mothers, and up to $3.90 for newborns only	4.5 million participants – 50%-60% of those eligible – received WIC services in March 1990, up by 1.4 million since Spring 1983.
PRENATAL CARE	Reduction in prematurity, low birthweight births and infant mortality; elimination or reduction of diseases and disorders during pregnancy	$1 investment can save $3.38 in cost of care for low birthweight infants	24% of live births in 1988 were to mothers who did not begin prenatal care in the first trimester of pregnancy. The rate for white births was 21%, for black births 39%. Figures reflect essentially no change since 1982.

MEDICAID	Decreased neonatal and infant mortality, and fewer abnormalities among children receiving EPSDT services	$1 spent on comprehensive prenatal care added to services for Medicaid recipients has saved $2 in infant's first year; lower health care costs for children receiving EPSDT services	In FY 1989, an estimated 10.6 million dependent children under 21 were served by Medicaid, including 2.5 million screened under EPSDT. Figures reflect an increase of approximately 600,000 served under Medicaid and 400,000 served under EPSDT since 1986. In calendar year 1989, there were 12.8 million related children under 21 in families below the poverty line, compared with 13.0 million in 1986.
CHILDHOOD IMMUNIZATION	Dramatic declines in incidence of rubella, mumps, measles, polio, diphtheria, tetanus and pertussis	$1 spent on Childhood Immunization Program saves $10 in later medical costs	No data available on percent of children immunized since 1985. In 1985, percent of children ages 1-4 immunized ranged from 73.8 for rubella to 87.0 for diphtheria-tetanus-pertussis. For those ages 5-14, percent immunized ranged from 85.3 for rubella to 93.0 for DTP. Increasing incidence of certain diseases has been reported.

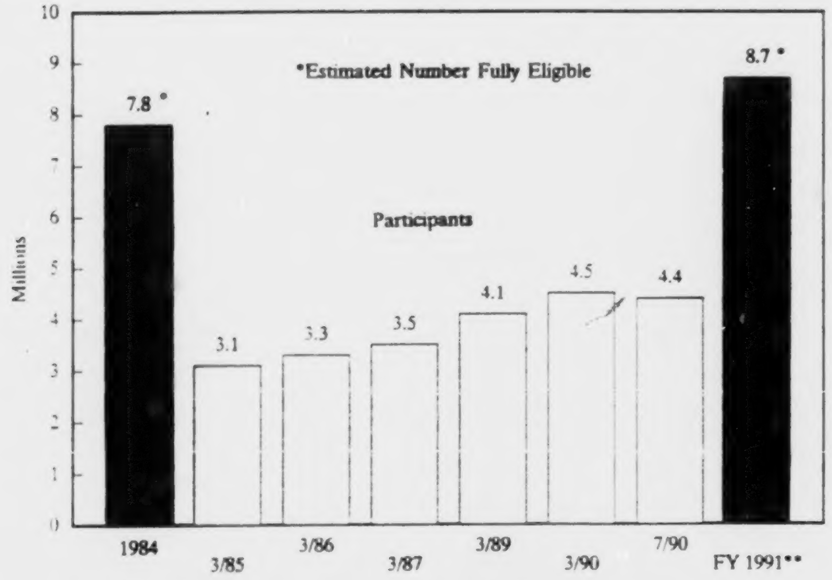
PRESCHOOL EDUCATION	Increased school success, employability and self esteem; reduced dependence on public assistance	$1 investment in quality preschool education returns $6 because of lower costs of special education, public assistance, and crime	In Oct. 1989, there were 11.1 million children ages 3-5. 6.03 million of them were enrolled in public and non-public pre-primary programs. 450,970 children -- fewer than 1 out of every 5 eligible -- were participating in Head Start in FY 1989. Head Start participation dropped by 1,000 since 1985.
COMPENSATORY EDUCATION	Achievement gains and maintenance of gains in reading and mathematics	Investment of $750 for year of compensatory education can save $3700 cost of repeating grade	In 1987, 4.92 million children -- an estimated 50% of those in need -- received Chapter 1 services under the LEA Basic Grant Program. Figure reflects essentially no change since 1985.
EDUCATION OF CHILDREN WITH DISABILITIES	Increased number of students receiving services in regular school setting; greater academic and employment success	Early educational intervention has saved school districts $1560 per student with disability	During School Year 1988-89, 4.587 million children ages 3-21 were served under the State Grant Program, up approximately 466,000 children served in 1985-86. The prevalence of disabilities in the population under age 21 is estimated to be 11.4% (9.5-10 million children).

YOUTH EMPLOYMENT AND TRAINING	Gains in employability, wages, and success while in school and afterwards	Job Corps returned $7,400 per participant, compared with $5,000 in program costs (in 1977 dollars). FY 1982 service year costs for YETP $4,700; participants had agnualized earnings gains of $1810.	During 1989 program year, 68,068 youths were enrolled in Job Corps; 334,380 served under JTPA Title IIA; 639,900 youths participated in summer youth programs. The annualized number of unemployed persons 16-21 years old in 1989 was 1,719,000 (13.2% overall, 29.4% black, 13.7% white, 20.9% Hispanic).
CHILDHOOD INJURY PREVENTION	Reduced risk of injury and less severe injuries; increased safety knowledge and behavior	Savings from use of child restraint devices estimated to exceed $2 million in one state over two years	Annually, more than 22,000 children ages 0-19 die from injuries. For each injury death, an additional 45 children are hospitalized and 1,300 visit emergency room for treatment of non-fatal injuries.
LEAD SCREENING AND REDUCTION	Early detection of elevated blood lead levels with treatment and abatement reducing exposure to and effects of lead poisoning, including poor birth outcomes and impaired cognitive functioning	Savings from reduction of effects of lead on U.S. children estimated at $500 million annually	An estimated 3 to 4 million preschool children have blood lead levels associated with adverse effects, and 400,000 infants are born with toxic blood lead levels every year.

SMOKING CESSATION PROGRAMS FOR PREGNANT WOMEN	Quit rates ranging from 6% to 32% with reduced prenatal, neonatal and postnatal problems pre- and postnatally, including reduced infant mortality, fewer low birthweight births, lowered risk of SIDS and other complications	Smoking cessation to some 350,000 pregnant smokers estimated at $1.75 million compared with more than $37 million in costs of low-birthweight births	An estimated 21-32 percent of U.S. pregnant women smoke during their pregnancies.
HOME VISITING	Early outreach to families with needed preventive services, such as prenatal care, social supports, skills training and preschool education; improved birth outcomes; reduced likelihood of maltreatment	Costs of home visiting range from $100 to $3,400 per family per year; annual savings estimated at $487 million in prevention of hospitalizations, rehabilitation, special education	Currently more that 4,500 efforts underway with services ranging from prenatal support to child development education.

PART I

WIC - Special Supplemental Food Program for Women, Infants and Children Participation



* Includes 50 States, District of Columbia, and Territories.

** CBO estimate of the number of people eligible for WIC in FY 1991.

Sources: "Estimation of Eligibility for the WIC Program." U.S. Department of Agriculture. Food and Nutrition Service. 1987.

Congressional Budget Office communication to the Select Committee on Hunger. September 11, 1990.

Participation data: Food and Nutrition Service.

SPECIAL SUPPLEMENTAL FOOD PROGRAM FOR WOMEN, INFANTS, AND CHILDREN (WIC)

Established in 1972 with an amendment to the Child Nutrition Act of 1966, WIC distributes funds to states and certain recognized Indian groups to provide supplemental foods to low-income, pregnant, postpartum, and nursing mothers, and infants and children up to age 5 who are diagnosed as being at nutritional risk. The WIC program provides food benefits which are specifically prescribed according to the nutritional needs of the participant. WIC also provides nutrition counseling and education, and serves as an adjunct to health care for the target population.

Average monthly participation in the WIC program, January-June 1990, was 4.5 million, a 10% rise over FY 1989, and about a 28% increase since March 1987. WIC reached about 60% of the eligible mothers, infants, and children who were financially and nutritionally eligible for the program at the beginning of 1990 (using U.S. Department of Agriculture's 1984 estimated eligible population).

Evaluations of the WIC program over the last decade have resulted in a body of evidence showing that the program greatly benefits needy women, infants and young children and is cost effective.

WIC participation has been associated with

Earlier and more adequate prenatal care and improved birth outcomes

- Increase in birthweight of infants born to program participants
- Reduction in the incidence of births of low birthweight infants
- Reduction in neonatal and infant mortality
- Increase in gestational age and reduction in prematurity among infants born to program participants

Largest improvements for populations at risk

Reduced prevalence of anemia among infants and young children

Improved cognitive skills in children

Access to regular health care

Cost effectiveness

- For every $1 spent on the prenatal component of WIC program (five-state study based on 105,000 Medicaid births), the associated savings in Medicaid costs during the first 60 days after birth ranged from $1.77 to $3.13 for newborns and mothers, and from $2.84 to $3.90 for newborns alone.
- WIC participation in Massachusetts showed that for every $1 invested in the prenatal component of WIC, as much as $3 are saved in short-term hospital costs. (Costs for longer-term treatment of disabilities caused by low birthweight are not included in calculated cost/benefit.)
- WIC participation in Missouri associated with the reduction in Medicaid newborn costs of about $76....For every $1 spent on WIC, about $0.49 in Medicaid costs within 30 days of birth are saved.

STUDIES

Improved Birth Outcomes

U.S. Department of Agriculture. Food and Nutrition Service. Office of Analysis and Evaluation. The Savings in Medicaid Costs for Newborns and Their Mothers from Prenatal Participation in the WIC Program. Vol. 1. Prepared by Mathematica Policy Research, Inc. Washington, DC. October 1, 1990.

> Study entailed analyses of the relationship between Medicaid costs and prenatal WIC participation in each of five states -- Florida, Minnesota, North Carolina, South Carolina, and Texas. In this review of a total of 105,000 Medicaid births, prenatal WIC participation was associated with substantial savings in Medicaid costs for newborns and their mothers during the first 60 days after birth. When newborn and maternal Medicaid costs were separated, the estimated savings in newborn Medicaid costs associated with prenatal WIC participation were even greater than the estimated savings in combined newborn and maternal Medicaid costs.

For every $1 spent on the prenatal WIC program, the associated savings in Medicaid costs during the first 60 days after birth ranged from $1.77 to $3.13 for newborns and mothers and from $2.84 to $3.90 for newborns only.

In all five study states, prenatal WIC participation by Medicaid recipients was associated with increased birthweight; the estimated increase in birthweight was greatest for births occurring before 37 weeks gestation. Prenatal WIC participation was also associated with a lower incidence of pre-term births and a longer gestational age.

U.S. General Accounting Office (GAO). The National WIC Evaluation: Reporting and Follow-Up Issues. GAO No. RCED-90-3. Washington, DC. December 1989.

GAO review of problems in publication of The National WIC Evaluation reported that the compendium of results developed by the U.S. Department of Agriculture contained errors and misleading statements about data, omitted the original summary, and consequently understated study findings. According to GAO, the original summary reported the study's main conclusions accurately: WIC improves the diet of pregnant women and children, adds to maternal weight gain, increases the use of prenatal care, reduces pre-term delivery, and increases use of regular medical care.

Stockbauer, J. "WIC Prenatal Participation and Its Relation to Pregnancy Outcomes in Missouri." American Journal of Public Health. July, 1987.

Study replicated 1980 evaluation of WIC effects on low birthweight rates and mean birthweights. WIC participation was associated with 16% decrease in percent of infants born weighing under 2,500 grams, and 27% decrease in percent born weighing under 1,500 grams. However, it found that seven months duration of mother's participation was necessary before significant effects occurred.

Schramm, W.F. "Prenatal Participation in WIC Related to Medicaid Costs for Missouri Newborns: 1982 Update." Public Health Reports. Vol. 101. November/December 1986.

Study replicated 1980 evaluation of WIC prenatal participation in Missouri utilizing 9,086 Medicaid records matched with corresponding birth records. In 1982, WIC participation was found to be significantly associated with an increase in mean birthweight of 31 grams and reductions in low birthweight rates of 23%. WIC infants had a significantly lower incidence of respiratory distress syndrome and immaturity reported than their non-WIC counterparts.

"WIC participation was also associated with a reduction in Medicaid costs for newborns reported within 45 days of birth amounting to $76 per participant. For every dollar spent on WIC, about $0.49 were apparently saved."

Buescher, P.A. "Source of Prenatal Care and Infant Birthweight: The Case of a North Carolina County." SCHS Studies. No. 30. North Carolina Department of Human Resources. March 1986.

Study of impact of comprehensive prenatal care on birthweights of infants born to low-income women found that the comprehensiveness of the program had a positive impact on birthweight. The study reported that "not being on WIC independently increased the chances of having a low-weight birth by 60%."

Rush, D. The National WIC Evaluation: An Evaluation of the Special Supplemental Food Program for Women, Infants, and Children. U.S. Department of Agriculture. 1986.

The National WIC Evaluation included four studies conducted concurrently to assess program effects. These studies and principal findings include:

The Historical Study of Pregnancy Outcome, which estimated overall changes in birth outcomes attributable to the WIC program over a nine-year period (1972 to 1980), found that WIC was associated with a 4.1% increase in early prenatal care registration and a 5% decrease in the proportion of women receiving inadequate prenatal care; reduction in pre-term deliveries; increased duration of gestation; increased birthweight ranging from 26 grams for babies born to less educated Afro-American mothers to 47 grams for babies born to less educated white mothers; and a 33% reduction in late fetal deaths.

The Longitudinal Study of Pregnant Women followed a nationally representative sample of pregnant women in WIC and a comparable non-WIC group. Highlights of findings from this study include: Increased intake of nutrients considered important to the diets of pregnant women; reversal after WIC program enrollment of low weight gain in early pregnancy; significantly reduced rates of pre-term delivery associated with WIC benefits among women with a history of past low birthweight delivery; and, evidence of increased circumferential head growth among infants born to WIC women.

The Study of Infants and Children, which assessed the dietary and developmental status of children, found that WIC participation was associated with better dietary intake, with the strongest effect among children who were poor, Afro-American, or in single-mother families; strong nutritional benefits from current WIC participation; better immunization; and, better vocabulary and digit memory.

The Food Expenditures Study, which measured the effect of WIC benefits on family food expenditures, found that women participating in WIC show significantly higher expenditures than non-WIC women on WIC-type (more nutritious) foods, although food expenditures among WIC families were not statistically different from the expenditures of non-WIC families.

Stockbauer, J.W. "Evaluation of the Missouri WIC Program: Prenatal Components." Journal of The American Dietetic Association. Vol. 86. No. 1. January 1986.

Using three methods of analysis, a study of Missouri WIC participants who delivered in 1980 and their offsprings' birth/fetal death certificates showed that WIC participants had smaller low birthweight rates and slight increases in mean birthweights than the non-WIC group. In addition, results indicated that duration in WIC had a positive influence on both mean birthweight and low birthweight.

Schramm, W.F. "WIC Prenatal Participation and Its Relationship to Newborn Medicaid Costs in Missouri: A Cost/Benefit Analysis." American Journal of Public Health. Vol. 75. No. 8. August 1985.

> Study conducted to "determine if WIC prenatal participation is associated with a reduction in Medicaid costs within 30 days after birth and, if so, whether the reduction in Medicaid costs is greater than the WIC costs for these women."
>
> "WIC participation was found to be associated with the reduction in Medicaid newborn costs of about $100 per participant; mother's Medicaid costs were not affected. For every dollar spent on WIC, about $0.83 in Medicaid costs within 30 days of birth were apparently saved...."

Institute of Medicine. Preventing Low Birthweight. Washington, DC: National Academy Press. 1985.

> As part of its study of issues and programs to prevent low birthweight, the Institute of Medicine (IOM) examined available data on the impact of WIC. The IOM concludes that the WIC program provides positive benefits to nutritionally and financially high-risk women. The IOM particularly noted reductions in the incidence of low birthweight births among WIC participants and the finding that early and consistent participation in the program during pregnancy is related to the magnitude of benefit. The IOM recommends "that nutrition supplementation programs such as WIC be a part of comprehensive strategies to reduce the incidence of low birthweight among high-risk women," and that "such programs be closely linked to prenatal services."

Kotelchuck, M., et al. "WIC Participation and Pregnancy Outcomes: Massachusetts Statewide Evaluation Project." American Journal of Public Health. Vol. 74. October 1984.

> WIC participation is associated with improved pregnancy outcomes, including a decrease in low birthweight incidence (6.9% versus 8.7%) and neonatal mortality (12 versus 35 deaths), an increase in gestational age (40.0 versus 39.7 weeks), and a reduction in inadequate prenatal care (3.8% versus 7.0%). Subpopulations at higher risk (teenage, unmarried and Hispanic origin women) have more enhanced pregnancy outcomes associated with WIC participation.

Kennedy, E.T., et al. "The effect of WIC supplemental feeding on birthweight: a case-control analysis." American Journal of Clinical Nutrition. Vol. 40. 1984.

> Participation in WIC is associated with a 107 gram increase in mean birthweight and a 40% decrease in the incidence of low birthweight (p = .059). Teenage, Afro-American and Hispanic women show similar, if not stronger, benefits.

U.S. General Accounting Office. WIC Evaluations Provide Some Favorable but No Conclusive Evidence on the Effects Expected for the Special Supplemental Program for Women, Infants and Children. GAO No. PEMD-84-4. Washington, DC. January 1984.

> GAO report reviewed WIC evaluations and, while noting unevenness in quality of available evidence, concluded that substantial data exist for increases in mean birthweight and decreases in the percentage of low birthweight infants.

Kennedy, E.T., et al. "Cost/benefit and cost/effectiveness of WIC." Unpublished paper. Testimony at hearing, Prevention Strategies for Healthy Babies and Healthy Children. Select Committee on Children, Youth, and Families. Washington, DC: U.S. House of Representatives. June 1983.

> Researchers conducted review of retrospective medical and nutrition data on 1,328 WIC and non-WIC pregnant women in Massachusetts. Analyses showed that participation in WIC was positively and significantly associated with birthweight. Cost-benefit analysis yielded a benefit-cost ratio of as much as 3.1:1 favoring WIC. Every dollar spent on WIC for the prenatal care component can save three dollars in hospital costs. Longer-term costs for treatment of disabilities caused by low birthweight were not addressed in the analyses, but data show that the incidence of handicaps increases as birthweight decreases.

Kennedy, E.T., et al. "Evaluation of the effect of WIC supplemental feeding on birth weight." Journal of The American Dietetic Association. Vol. 80. 1982.

> Harvard School of Public Health study showed average gain of 122 grams in birthweight among infants born to WIC participants.

Kotelchuck, M., et al. Final Report: Massachusetts Special Supplemental Food Program for Women, Infants and Children (WIC) Follow-up Study. 1982.

> Follow-up study found a increase from +23 to +23.5 grams in mean WIC effect on birthweight that again averaged 110 grams in women participating in WIC for more than six months.

Kotelchuck, M., et al. Final Report: 1980 Massachusetts Special Supplemental Food Program for Women, Infants and Children Evaluation Project. Submitted to Food and Nutrition Service, U.S. Department of Agriculture, Washington, DC. 1981.

> Study by Kotelchuck and colleagues at Harvard found positive effect of WIC participation on birthweight of infants born to program participants. Gains averaged 110 grams in women participating in WIC for more than six months. The study and follow up also found significantly fewer neonatal deaths in infants born to WIC mothers when compared to babies of non-WIC women.

Endozien, J., et al. Medical evaluation of the Supplemental Food Program for Women, Infants and Children. U.S. GPO, 75-123, Washington, DC. 1976.

> Researchers at University of North Carolina reported average gains of +136 grams in birthweight of infants of program participants.

Effects for Populations at Higher Risk

U.S. Department of Agriculture. 1990. op. cit.

Rush, D. 1986. op. cit.

Institute of Medicine. 1985. op. cit.

Kotelchuck, M., et al. 1984. op. cit.

Kennedy, E.T., et al. 1984. op. cit.

Decrease in Prevalence of Anemia Among Low-Income Children

Yip, R., et al. "Declining Prevalence of Anemia Among Low-Income Children in the United States." Journal of the American Medical Association. Vol. 258. No. 12. September 25, 1987.

> A study of children enrolled in WIC and other public health programs showed that the prevalence of anemia declined significantly among children seen "at pre-enrollment screening visits, as well as those seen at follow-up visits, suggesting a generalized improvement in childhood iron nutritional status in the United States, as well as a positive impact of public health programs."

Vasquez-Seoane, P., et al. "Disappearance of Iron-Deficiency Anemia in a High-Risk Infant Population Given Supplemental Iron." Special Report. New England Journal of Medicine. Vol. 313. No. 19. November 1985.

> Study reviewing records comparing hemoglobin status of children seen at an inner-city health center prior to establishment of the WIC program with status of health center children 95% of whom were enrolled in the WIC program showed "near disappearance of nutritional anemia in an inner-city population of poor infants and children between 1971 and 1984." Investigators concluded that "supplementation of the diets of these children by iron-rich foods provided by the WIC program is the most likely explanation for the improved hematologic status...."

Improved Cognitive Skills

Rush, D. 1986. op. cit.

Access to Regular Health Care

U.S. General Accounting Office. 1989. op. cit.

Cost Effectiveness

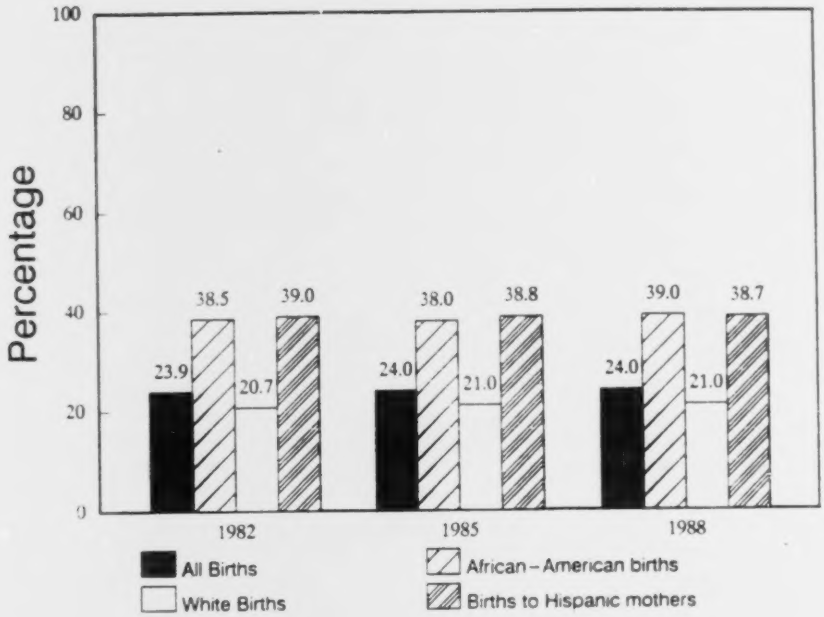
U.S. Department of Agriculture. 1990. op. cit.

Schramm, W.F. 1986. op. cit.

Schramm, W.F. 1985. op. cit.

Kennedy, E.T., et al. 1983. op. cit.

Prenatal Care
Percent of Live Births to Mothers Not Beginning Prenatal Care in First Trimester of Pregnancy



Sources: U.S. Dept. of Health and Human Services, National Center for Health Statistics, [NCHS]. Advance Report of Final Natality Statistics, 1988. Monthly Vital Statistics. Vol. 39. No. 4, Supplement. August 1990.

NCHS. Advance Report of Final Natality Statistics, 1985. Monthly Vital Statistics. Vol. 36. No. 4, Supplement. July 1987.

NCHS. Advance Report of Final Natality Statistics, 1982. Monthly Vital Statistics. Vol. 33. No. 6. September 1984.

PRENATAL CARE

Several public programs provide support for prenatal care services for low-income pregnant women. The major programs are the Maternal and Child Health Services Block Grant, permanently authorized under Title V of the Social Security Act, and Medicaid, permanently authorized under Title XIX of the Social Security Act. Section 330 of the Public Health Service Act establishes grants to Community Health Centers to provide primary health care services to residents of medically underserved areas, including pregnant women and infants.

Early and adequate prenatal care has been associated with improved pregnancy outcomes, and the lack of such care with increased risk of low birthweight and other poor pregnancy results.

Research on the effectiveness and value of prenatal care clearly demonstrates

Improved maternal and child health

- Reduction in infant mortality
- Reduction in low birthweight
- Decrease in prematurity
- Most effective reduction in low birthweight births among high-risk women, whether the risk derives from medical factors, sociodemographic factors, or both
- Elimination or reduction of diseases and disorders during pregnancy that can threaten health of mother and infant

Cost effectiveness

- For every low birthweight birth averted by earlier or more frequent prenatal care, the U.S. health care system saves between $14,000 and $30,000 in newborn hospitalization, rehospitalization in the first year, and long-term health care costs associated with low birthweight.
- Reduction of the number of disabled low birthweight babies by one-half would save $0.9 to $1.9 billion in wages earned over their lifetimes.

- **An estimated net $30.2 million could be saved in the first year alone from the provision of prenatal care to the 36,000 pregnant women in California who now go without it. When the future costs of caring for disabled children are taken into account, the investment in prenatal care nets a savings of up to $345.6 million.**

- At the University of California at San Diego in 1985, an average of $2,200 more was spent on hospital care for each baby born to a mother receiving no prenatal care than on babies whose mothers received adequate prenatal care.

- **Between 10,000 and 13,000 premature babies are admitted to newborn intensive care units each year in California at a cost of $70 million to the state's MediCal program. An estimated one-third of those premature births and their associated medical costs could have been avoided with adequate prenatal care.**

- The Institute of Medicine calculated that for every $1 spent, $3.38 can be saved in the cost of care for low birthweight infants.

- A Michigan Department of Public Health analysis shows that for every $1 spent, $6.12 could be saved in newborn intensive care costs.

- The Colorado Health Department estimated that $9 could be saved in medical expenses of premature infants for every dollar spent, if comprehensive prenatal care were provided to low-income women.

STUDIES

Improved Maternal and Child Health

Mason, J.O., Assistant Secretary for Health, Department of Health and Human Services. Testimony at hearing, Caring for New Mothers: Pressing Problems, New Solutions. Select Committee on Children, Youth, and Families. Washington, DC: U.S. House of Representatives. October 24, 1989.

Mason estimated that 10,000 of the 40,000 infants who die each year could be saved by applying what is known about health promotion, reduction of behavioral risk factors and access to quality primary health care. He cited estimates of $2 billion annually in hospital costs for low birthweight babies, compared with expenditures of $500 million annually for providing prenatal care to those not receiving it now.

Murray, J.L. "The Differential Effect of Prenatal Care on the Incidence of Low Birth Weight Among Blacks and Whites in a Prepaid Health Care Plan." The New England Journal of Medicine. Vol. 319. No. 21. November 1988.

> Assessment of prenatal care in California HMOs (Health Maintenance Organizations) showed increased levels of prenatal care associated with greater reduction of low birthweight, very low birthweight, and low birthweight at term among African-American infants than among white infants. The study found adequate prenatal care led to a 3.6-fold reduction of risk of giving birth to a very low birthweight infant for African-American mothers, and a 2.1-fold decrease in risk for white mothers.

Lazarus, W. and Tirengel, J. Back to Basics in 1988: Strategies for Investing in the Health of California's Next Generation. A Report of the Southern California Child Health Network and the Children's Research Institute of California. 1988.

> "Babies born to mothers receiving adequate prenatal care are four times more likely to live than babies whose mothers received no prenatal care. They are nearly three times as likely to be born at adequate birthweight."
>
> It costs $43.2 million to provide prenatal care to California's 36,000 unreached pregnant women. This investment saves $73.4 million, with a net savings of $30.2 million in avoided hospital costs for children in their first year of life. This investment nets a savings of up to $345.6 million when future costs of caring for disabled children are taken into account.

"Larger Share of Maternal Deaths for Massachusetts Women With Poor Prenatal Care." Family Planning Perspectives. Vol. 19. No. 5. October 1987.

> A review by the maternal mortality committee of the Massachusetts Medical Society of all maternal deaths that occurred in the state between 1954 and 1985 indicated an increase over the

past ten years in the proportion of women dying as a result of pregnancy or childbirth who received no or inadequate prenatal care. In 1976-1979, 17% of women who died had not received adequate prenatal care; by 1982-85, this proportion had increased to 55%."

Miller, C.A. Maternal Health and Infant Survival. Washington, DC: National Center For Clinical Infant Programs. July 1987.

> Study examined pregnancy-related supports and services in ten western European countries and in the United States. Miller pointed out that demographic similarities have increased over the last 40 years due to migration in the European nations. This study documented lower rates of low birthweight in those countries compared to the U.S. overall and for U.S. white births which have the lowest rates in this country. It also documented that pregnancy and maternity services are assured to women of all socioeconomic levels in the European nations using many diverse strategies. With regard to national finances, the study explained that "expansion of services and supports related to childbearing has not been a deterrent in most countries to efforts for holding firm or even reducing the proportion of gross national product committed to health care....These observations justify the conclusion that national policies that assure participation in free maternity services are compatible with low national cost of health care and may actually contribute to economies."

Lazarus, W. and West, K. Back to Basics: Improving the Health of California's Next Generation. A Report of the Children's Research Institute of California and the Southern California Child Health Network. 1987.

> Study of the provision of prenatal and perinatal care in California reported that
>
>> Babies born to mothers receiving adequate prenatal care are five times more likely to live than babies whose mothers received no prenatal care, and are more than one and one-half times as likely to be born at adequate birthweight.
>>
>> "An estimated one-half of the mothers at risk for premature labor can be taught through good prenatal care to reduce their chances of premature labor."

> "According to the most conservative projections, between 10,000 and 13,000 premature babies are admitted to newborn intensive care units each year in California at a cost of $70 million to the state's MediCal program. An estimated one-third of those premature births and their associated medical costs could have been avoided with adequate prenatal care."
>
> "At UC-San Diego in 1985, an average of $2,200 more was spent on hospital care for each baby born to a mother receiving no prenatal care than on babies whose mothers received adequate prenatal care. If California could reach even half of the 32,000 pregnant women who receive late or no prenatal care, over $35 million could be saved in prevented newborn hospitalization alone."
>
> Authors also estimate that "it will cost approximately $32 million per year to provide prenatal care to the pregnant women [in California] who now go without it. Savings from this investment in the first year alone amount to an estimated $54.4 million -- for a net savings of $22.4 million. Over time, by avoiding preventable disabilities in children, the savings could increase to approximately $2.6 billion annually."

Council on Maternal and Child Health, National Association for Public Health Policy. "Background Paper on Universal Maternity Care." Journal of Public Health Policy. Vol. 7. No. 1. Spring 1986.

> Report on maternity care documents that comprehensive prenatal care can eliminate or reduce the effects of diseases or disorders during pregnancy, such as diabetes, anemia, hypertension, etc., which can lead to problems for mother and infant unless properly treated; and decrease the likelihood of a baby being born low birthweight, "the single most important factor associated with infant mortality." The review further reports that while effects of prenatal care on newborn health can be seen most sharply in comparisons of those infants born to mothers who received any prenatal care versus those born to women who have had no prenatal care, "the number of prenatal visits also makes a difference, with the risk of poor health decreasing with more and earlier visits during the pregnancy." Authors concluded that "providing comprehensive, prevention-oriented perinatal care is

approximately five times more cost effective than providing treatment-oriented medical serves."

Buescher, P.A. "Source of Prenatal Care and Infant Birthweight: The Case of a North Carolina County." SCHS Studies. No. 30. North Carolina Department of Human Resources. March 1986.

> Study of impact of comprehensive prenatal care on birthweights of infants born to low-income women found that the comprehensiveness of the program had a positive impact on birthweight. Women receiving a comprehensive, coordinated program of prenatal care and ancillary services through the Guilford County public health department were compared to pregnant Medicaid-eligible women in the same county who received prenatal care primarily from private-practice physicians. The study reported that the percent of low birthweight births was 19.3% in the Medicaid group versus 8.3% in the comprehensive care/health department group, and that "the ancillary services of the health department program appear to be most beneficial among those women who start prenatal care late." The study also found that, among the low-income women in the study, "not being on WIC independently increased the chances of having a low-weight birth by 60%."

Moore, T.R., et al. "The Perinatal and Economic Impact of Prenatal Care in a Low-Socioeconomic Population." American Journal of Obstetrics and Gynecology. Vol. 154. 1986.

> A study to assess the economic and perinatal impact of the increasing number of deliveries by women without prenatal care showed similar maternal obstetric outcomes, but experienced significantly more neonatal complications when compared with women enrolled in San Diego County's Comprehensive Perinatal Program. "When the total inpatient hospital charges were tabulated for each mother-baby pair, the cost of perinatal care for the group receiving no care ($5,168 per pair) was significantly higher than the cost for patients in the Comprehensive Perinatal Program ($2,974 per pair, $p \leq .001$) including an antenatal charge of $600 in the Comprehensive Perinatal Program. The excess cost for delivery of 400 women receiving no care per year in the study hospital was $877,600."

Levy, M. "Prenatal Care for Medicare Clients." New England Journal of Human Services. Vol. VI. Issue 2. 1986.

> Review reports 1984 Kansas study examining data on 120,212 births during 1980-82. Five percent of women with adequate prenatal care had low birthweight infants compared with 11% and 12% for women with inadequate care. A later study was conducted to determine whether low-income clients receiving the state's medical assistance program (including Medicaid and MediKan) obtained prenatal care, and if they did not, what the effect was on incidence of low birthweight births. The study found that nearly one-third of the clients on medical assistance did not receive adequate prenatal care; and among the 4,056 clients without illnesses or complications, the incidence of low birthweight was significantly lower for clients who had more prenatal visits. "Medical assistance costs for each infant requiring prenatal intensive care were $15,000 in 1985 compared with $700 for a healthy infant....[It] would cost about an additional $75,000 if all Medical Assistance clients received adequate prenatal care. Based on the Institute of Medicine's conclusions, in return for this expenditure the state would save $225,000 in medical costs for low birthweight infants."

National Institute of Medicine. Preventing Low Birthweight. Washington, DC: National Academy Press. 1985.

> Review of studies shows that "overwhelming weight of the evidence is that prenatal care reduces low birthweight. This finding is strong enough to support a broad, national commitment to ensuring that all pregnant women, especially those at medical or socioeconomic risk, receive high-quality care."
>
> "Prenatal care is most effective in reducing the chance of low birthweight among high-risk women, whether the risk derives from medical factors, sociodemographic factors, or both."
>
> IOM's cost-benefit analysis shows that if the improved use of prenatal care "reduced that rate of low birthweight in the target population from the current 11.5% to only 10.76%, the increased expenditures for prenatal services would be approximately equal to a single year of cost savings in direct medical care expenditures for low birthweight infants in the target population. If the rate were reduced to nine percent (Surgeon General's 1990 goal for a maximum low birthweight rate among high-risk groups), every

> additional dollar spent for prenatal care within the target group would save $3.38 in the costs of care for low birthweight infants because there would be fewer low birthweight infants requiring expensive medical care."

Korenbrot, C.C. "Risk Reduction in Pregnancies of Low-Income Women: Comprehensive Prenatal Care through the OB Access Project." Mobius. Vol. 4. 1984.

> The OB Access Project provided comprehensive obstetrical services for low-income women, including eight or more prenatal visits, health and nutrition assessment and education, and prenatal vitamins. Project evaluation showed lower incidence of low birthweight births among OB Access Project participants than those who received less intensive, standard or more variable care.

Sprague, H.A., et al. "The Impact of Maternity and Infant Care Programs on Perinatal Mortality." Perinatology-Neonatology. August 1983.

> Evaluation of MIC (Maternal and Infant Care) project in Michigan showed dramatic declines in the rate of perinatal mortality among women receiving MIC services. "For patients whose most recent non-MIC pregnancies resulted in fetal or neonatal death, the rate of more than 300/1,000 was reduced significantly, to 48.8/1,000 under MIC. For those patients whose most recent non-MIC pregnancies did not result in fetal or neonatal death, previous rates of more than 60/1,000 were reduced significantly under MIC to 19.8/1,000."

Bondy, J. "Cost-Benefits of Selected Preventive Care Interventions." Colorado's Sick and Uninsured: Background Papers. Boulder, CO: Colorado Task Force on the Medically Indigent. 1984. Also, "Cost-Benefit of Prenatal Care." Memorandum to Task Force Members. 1983.

> Colorado study cites findings from local studies showing that women who received early and continuous prenatal care had a prematurity rate of 5%, while women who received no care experienced a prematurity rate of 28%. Further, the Colorado Health Department estimated that "if comprehensive prenatal care was provided to low-income women, $9 could be saved in medical

expenses of premature infants, for every dollar spent in prenatal care, eleven state dollars would be saved."

O'Hare, D. Testimony at hearing, Children, Youth, and Families in the Northeast. Select Committee on Children, Youth, and Families. Washington, DC: U.S. House of Representatives. July 25, 1983.

Testimony describes effects of MIC-FP (Maternal and Infant Care-Family Planning) program in New York City, which serves almost 10% of pregnant women. Based on a 1980 study of the program, it was estimated that "almost $2 million was saved in hospital costs alone by providing prenatal care and decreasing low-birth weight."

Sokol, R., et al. "Risk, Antepartum Care, and Outcome: Impact of a Maternity and Infant Care Project." Obstetrics and Gynecology. Vol. 56. 1980.

Study in Cleveland found that women who received comprehensive prenatal care at the city's Maternity and Infant Care Project experienced 60% less perinatal mortality and a 25% lower rate of preterm deliveries than similar women not enrolled in the project. Maternal and Infant care project participants received more patient education, nutrition counseling, social service assessment and intervention, social services for adolescents and special follow-up services for those who miss appointments. Study suggests that these components of care are important for the outcomes.

Kessner, D. (ed.). Infant Death: An Analysis by Maternal Risk and Health Care. Contrasts in Health Status. Vol. 1. Institute of Medicine. Washington, DC: National Academy of Sciences. 1973.

Landmark study of births in New York City in 1968 found significant association between adequacy of prenatal care and the percentage of low birthweight newborns in each of the risk groups examined, controlling for ethnicity. Gains were greatest for those at highest risk because of sociodemographic or medical risk factors.

Cost Effectiveness

U.S. Department of Agriculture. Food and Nutrition Service. Office of Analysis and Evaluation. The Savings in Medicaid Costs for Newborns and Their Mothers from Prenatal Participation in the WIC Program. Vol. 1. Prepared by Mathematica Policy Research, Inc. Washington, DC. October 1, 1990.

> Study entailed analyses of the relationship between Medicaid costs and prenatal WIC participation in each of five states -- Florida, Minnesota, North Carolina, South Carolina, and Texas. The estimated savings in Medicaid costs from birth to 60 days after birth associated with prenatal WIC participation are independent of the effects of prenatal care on Medicaid costs. Analytical results also show that considerable Medicaid cost savings during the 60-day period after birth are associated with receiving adequate or intermediate levels of prenatal care.
>
> For newborns and mothers, the estimated savings in Medicaid costs during the first 60 days after birth associated with receiving adequate or intermediate levels of prenatal care were $267 in Florida, $362 in Texas, $623 in South Carolina (hospital costs only), $415 in North Carolina, and $1,005 in Minnesota.
>
> For newborns only, the estimated reductions in Medicaid costs during the 60-day period after birth associated with receiving adequate or intermediate levels of prenatal care were $610 in Texas and $593 in North Carolina.

White House Task Force on Infant Mortality. Infant Mortality in the United States (Draft). Washington, DC. November 30, 1989.

> Each infant death represents an estimated $380,000 in lost productivity (the present value of future lifetime earnings in 1985 dollars, using a 4% discount rate). Thus, if the United States could achieve the infant mortality rate of Massachusetts, the state with the lowest rate, it would realize $2.3 billion in increased productivity. If it could achieve the infant mortality rate of Japan, the country with the lowest rate, it would realize nearly $7 billion in increased productivity.

Mason, J.O. October, 1989. op. cit.

The National Commission to Prevent Infant Mortality. Death Before Life: The Tragedy of Infant Mortality. Washington, DC. August 1988.

> Reduction of the number of disabled low birthweight babies by one-half would save $0.9 to $1.9 billion in wages earned over their lifetimes. Cost-benefit estimates range from $2 to $10 saved for every $1 spent on prenatal care. "The evidence to support the value of prenatal care is strong enough to support a national commitment to ensuring that all pregnant women receive prenatal care."

Joyce, T. "A Cost Effectiveness Analysis of Strategies to Reduce Infant Mortality." Medical Care. Vol. 26. No. 4. April 1988.

> Study compares the cost effectiveness of interventions to reduce neonatal mortality in the first 27 days of life. Early initiation of prenatal care is the most cost-effective means of reducing neonatal mortality, and reducing low birthweight. The savings from averting one low birthweight birth are estimated to be $14,799.

U.S. Office of Technology Assessment. Healthy Children: Investing in the Future. Washington, DC: U.S. Office of Technology Assessment. February, 1988.

> For every low birthweight birth averted by earlier or more frequent prenatal care, the U.S. health care system saves between $14,000 and $30,000 in newborn hospitalization, rehospitalization in the first year, and long-term health care costs associated with low birthweight.

Lazarus, W. and Tirengel, J. 1988. op. cit.

Lazarus, W. and West, K. 1987. op. cit.

Council on Maternal and Child Health, National Association for Public Health Policy. 1986. op. cit.

Moore, T.R., et al. 1986. op. cit.

Institute of Medicine. 1985. op. cit.

Korenbrot, C. "Comprehensive Prenatal Care as Medical Benefit: Expected Costs and Savings." San Francisco, CA: University of California at San Francisco. 1984.

> Study of comprehensive prenatal care program demonstrated cost savings of $2 in the first year of infant's life for every $1 spent on prenatal care in the project.

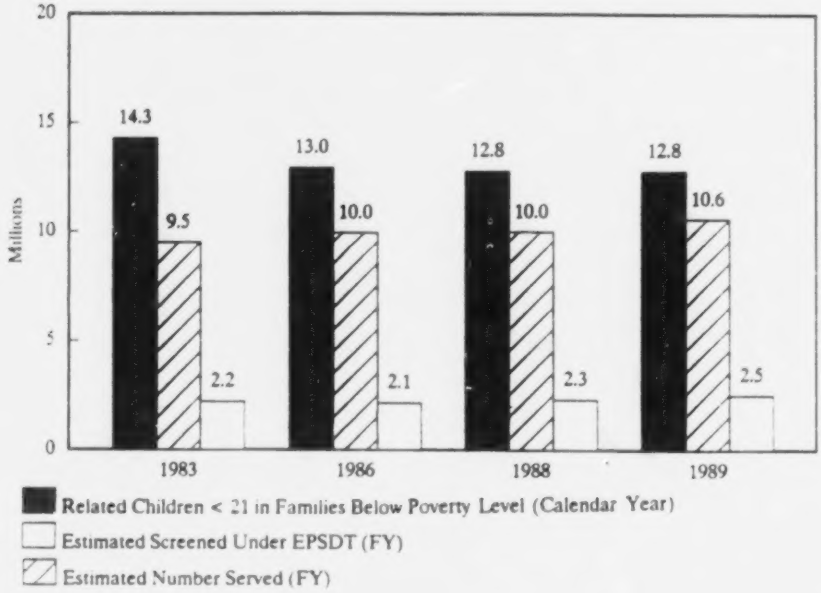
Taylor, J. "Prenatal and Postpartum Maternity Care as a Cost Containment Measure." Michigan Department of Public Health. Unpublished paper. 1984.

> Cost benefit analysis of providing prenatal care shows that for every $1 spent, an estimated $6.12 could be saved in newborn intensive care costs in Michigan.

Bondy, J. 1983. op. cit.

O'Hare, D. 1983. op. cit.

Medicaid
Participation of Dependent Children Under 21



Sources: Participation data: U.S. Department of Health and Human Services. Health Care Financing Administration.

Related Children Under Age 21 in Families Below Poverty in 1983 and 1985 based on Current Population Survey, was computed by the Congressional Research Service. The same data for 1988 and 1989 were computed by the U.S Department of Commerce, Bureau of the Census.

Note: Medicaid service category "dependent children under 21" includes those in institutions or otherwise categorically eligible whose family resources may not fall below poverty.

MEDICAID

Medicaid, permanently authorized by Title XIX of the Social Security Act, is a federal-state matching program providing medical assistance to certain low-income persons who are aged, blind, disabled, members of families with dependent children, or certain other poor pregnant women and children. In 1982, Medicaid funding represented an estimated 55% of all public health funds spent on children. The largest single hospital inpatient service funded by Medicaid is routine newborn deliveries.

Medicaid coverage for health care services for poor pregnant women and infants over the past 20 years has been a factor in the improvements in health care and health status indicators. Since 1984, legislation has expanded eligibility to more low-income pregnant women and children. Beginning in 1988, states were allowed to extend Medicaid eligibility to pregnant women and infants with incomes up to 185% of the federal poverty standard. As of April 1990, state Medicaid programs are required to provide Medicaid coverage to all pregnant women, infants, and children under age 6 with family incomes below 133% of the federal poverty level. Prior to this change, mandatory Medicaid coverage applied to women and infants with family incomes up to 100% of the poverty level.

In calendar year 1988, there were 12.8 million related children up to age 21 in families below the poverty line. In FY 1989, 10.6 million dependent children under 21 received Medicaid services. In calendar year 1989, there were 3.6 million screenings conducted under Medicaid's Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program. In addition, one million children received continuing care services. In 1989, Congress enacted legislation to enhance EPSDT coverage. Medicaid must now pay for treatment of illnesses discovered during routine screening visits, even if those illnesses are not generally covered by a state's Medicaid program.

Evaluations of the effects of Medicaid coverage show

Improved health outcomes for low-income children and families

- Reduction of neonatal and infant mortality rates
- Fewer abnormalities at periodic exams among children who receive EPSDT preventive services than among those not receiving them

Cost effectiveness

- Health care costs are lower for children who receive preventive EPSDT services than for those who do not

- Medicaid-supported, comprehensive prenatal care resulted in cost savings of $2 in the first year of infant life for every $1 spent

STUDIES

Improved Health Outcomes

Buescher, P.A., et al. "An Evaluation of the Impact of Maternity Care Coordination on Medicaid Birth Outcomes in North Carolina." Raleigh, NC. In Press. 1990.

> Evaluation of Baby Love Program, a joint venture of the North Carolina state departments of Medicaid and Maternal and Child Health, studied more than 21,000 births to assess the impact of maternity care coordination on services on the birth outcomes of Medicaid women. Controlling for risk factors and source of prenatal care, women not receiving maternity care coordination services had a percentage low birthweight (under 2,500 grams) 17% higher than those receiving coordination services, a percentage very low birthweight (under 1,500 grams) 67% higher, and a neonatal mortality rate 39% higher. Medicaid recipients receiving maternity care coordination were significantly more likely to participate in WIC (91% versus 67%). Other North Carolina data show that for health department patients, women receiving maternity care coordination were more likely to have had a postpartum family planning exam (68% versus 39%) and to have received well-child care for their infants (65% versus 25%) than women not receiving care coordination services.
>
> Cost-effectiveness analysis of North Carolina Baby Love Program showed $2.44 saved by Medicaid in newborn medical costs up to 60 days post-birth for each $1.00 spent for maternity care coordination. Total savings for calendar year 1988 estimated at $979,000.

Rosenbach, M.L. "The Impact of Medicaid on Physician Use by Low-Income Children." American Journal of Public Health. Vol. 79. No. 9. September 1989.

> Study designed to evaluate the determinates of physician use by low-income children, using data from the 1980 National Medical Care Utilization and Expenditure Survey. Analysis found that children with Medicaid coverage averaged 2.9 physician visits in 1980 while those with no insurance averaged 1.8 visits. Those with Medicaid coverage were also more likely to visit a physician in an office setting. Concludes that "Medicaid coverage increases access to office-based physicians, within the low-income population."

Braveman, P. "Adverse Outcomes and Lack of Health Insurance Among Newborns in an Eight-County Area of California, 1982 to 1986." The New England Journal of Medicine. Vol. 321. August 1989.

> Study of hospital data showed an increasing lack of health insurance to be associated with elevated and increased risk of health problems in infants: prolonged hospital stay, more serious medical condition, or death.

Copeland, G.W. "Gaining Ground: The Impact of Medicaid on Infant Mortality." American Politics Quarterly. Vol. 15. No. 2. April 1987.

> Using time series analysis, the study estimates the impact of Medicaid on infant deaths, as an estimate of its impact on the health of pregnant women. Estimates that "Medicaid expenditures reduced infant deaths nationwide by 24,533 in 1981 and 22,726 in 1982."

Levy, M. "Prenatal Care for Medicare Clients." New England Journal of Human Services. Vol. VI. Issue 2. 1986.

> Review reports 1984 Kansas study examining data on 120,212 births during 1980-82. Five percent of women with adequate prenatal care had low birthweight infants compared with 11% for women with marginal care and 12% for women with inadequate care. A later study was conducted to determine whether low-income clients receiving the state's medical assistance program (including Medicaid and MediKan) obtained prenatal care, and if

they did not, what the effect was on incidence of low birthweight births. The study found that nearly one-third of the clients on medical assistance did not receive adequate prenatal care; and among the 4,056 clients without illnesses or complications, the incidence of low birthweight was significantly lower for clients who had more prenatal visits. "Medical assistance costs for each infant requiring prenatal intensive care were $15,000 in 1985 compared with $700 for a healthy infant. Based on the Institute of Medicine's conclusions, in return for this expenditure the state would save $225,000 in medical costs for low birthweight infants."

Institute of Medicine. Preventing Low Birthweight. Washington, DC: National Academy Press. 1985.

IOM review of research on preventing low birthweight concludes:

> "Medicaid increases participation in prenatal care by lowering financial barriers to such services. And because participation in prenatal care is associated with improved birthweight, efforts to expand and strengthen the Medicaid program should be part of a comprehensive program to reduce the nation's incidence of low birthweight. Decreasing the participation of pregnant women in the Medicaid program by such means as changing welfare or Medicaid eligibility criteria serves only to undermine the purpose of the program and, among other things, threatens appropriate use of prenatal care and increases costs for low birthweight infant care. Changes in the program should be dedicated to enrolling more, not fewer, indigent, eligible women in the program and to providing them with early and regular prenatal care of high quality."

Keller, W. "A Study of Selected Outcomes in the Early and Periodic Screening Diagnosis and Treatment Program in Michigan." Public Health Reports. March-April 1984.

Children receiving EPSDT preventive services exhibit fewer abnormalities at periodic exams than those who do not receive such benefits. Overall health care costs for children participating in the program are significantly lower than for those who do not participate, even when all the costs of administering EPSDT are taken into account.

Korenbrot, C. "Comprehensive Prenatal Care as a Medical Benefit: Expected Costs and Savings." San Francisco, CA: University of California. 1984.

> Research project involving the provision of comprehensive health care to pregnant women demonstrated improved health outcomes for babies whose mothers participated in the project and cost savings of $2 in the first year of infant life for every $1 spent on prenatal care through the project.

Hadley, J. More Medical Care, Better Health? Washington, DC: The Urban Institute. 1983.

> State Medicaid coverage policies for pregnant women and children have helped in the reduction of neonatal and infant mortality rates since 1966.

Budetti, P., et al. "Federal Health Program Reforms: Implications for Child Health Care." Milbank Memorial Fund. 1982.

> Medicaid represents 55% of all public health funds spent on children.

National Center for Health Statistics. Advance Data: Expected Principal Source of Payment for Hospital Discharge. U.S. 1977.

> The largest single hospital inpatient service funded by Medicaid is routine newborn deliveries.

Cost Effectiveness

Buescher, P.A., et al. 1990. op. cit.

Levy, M. 1986. op. cit.

Keller, W. 1984. op. cit.

Korenbrot, C. 1984. op. cit.

Bureau of Program Operations, Health Care Financing Administration, U.S. Department of Health and Human Services. Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) Program Report: Fiscal Year 1983. September 26, 1983.

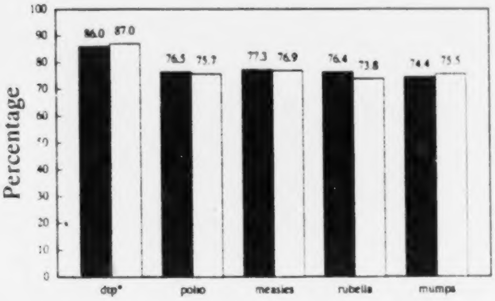
Report cites cost-benefit evaluation from several states:

> "Bailey of North Carolina's Department of Human Resources, examined costs for 1980-82, after excluding the experience of over 1,000 children residing in mental retardation centers and found that annual Medicaid savings per participant were $29.58, $14.57 and $30.20 for 1980, 1981 and 1982 respectively....McMurray of the Ohio Department of Public Welfare examined costs for 1982 and found annual Medicaid savings per participant of $250."

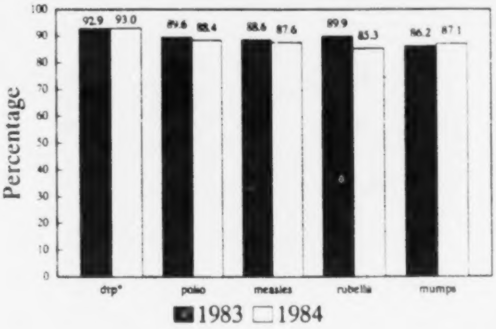
"Administrative Petition to Reduce the Incidence of Low Birth Weight and Resultant Infant Mortality." An Administrative Petition to the United States Department of Health and Human Services. July 29, 1983. Testimony at hearing, Prevention Strategies for Healthy Babies and Healthy Children. Select Committee on Children, Youth, and Families. Washington, DC: U.S. House of Representatives. June 30, 1983.

Petitioner's analysis of cost savings showed that the federal government could save more than $361 million per year in Medicaid costs by providing comprehensive prenatal care to all low-income women.

Childhood Immunization Program
Children Ages 1-4



Children Ages 5-14



*DTP = Diphtheria-tetanus-pertussis

Source: U.S. Centers for Disease Control. U.S. Immunization Survey, Annual.

Note: The last childhood immunization survey was conducted in 1985. Between 1984 and 1988, the number of reported cases of mumps and measles increased, due in part to new cases in children. The lack of recent data on childhood immunization underscores the need for current research. (U.S. Department of Commerce. Bureau of the Census. Statistical Abstract of the United States: 1990.

CHILDHOOD IMMUNIZATION

The Childhood Immunization Program, currently authorized under P.L. 100-177, which amended Section 317(J) of the Public Health Service Act, helps states and localities to establish and maintain immunization programs for the control of vaccine-preventable childhood diseases, including measles, rubella, poliomyelitis, diphtheria, pertussis, tetanus and mumps. Since 1985, a new vaccine (Haemophilus influenzae type b [Hib]) to prevent childhood meningitis has been approved and is among the recommended vaccination series. According to the Centers for Disease Control (CDC), appropriate administration of safe and effective vaccines remains the most cost-effective method of preventing human suffering and reducing economic costs resulting from vaccine-preventable diseases. One-half of the vaccines are distributed by the public sector.

Assessments of the immunization program for children against the major diseases of rubella, mumps, measles, polio, diphtheria, tetanus, pertussis and meningitis have shown

Dramatic declines in the incidence of many diseases because of widespread immunization

- Estimated prevention of 23,100 cases of mental retardation and the saving of 7,100 children's lives from 1963-89 because of measles immunizations
- Decrease in number of reported cases of rubella by nearly 99% compared to pre-vaccine years (pre-1969)
- Drop in reported cases of mumps by 97.2%, from 105,000 to 2,900 from 1970-1985
- Decrease in reported cases of measles, polio and diphtheria by more than 99% from 1960-1985
- Decrease in reported cases of pertussis by 77.7% and tetanus by 80.1% from 1960-1985

Continued serious threat of the major childhood diseases in the absence of immunization; a drop in the percent of young children immunized against most diseases

- Hib infection accounts for an estimated 12,000 cases of bacterial meningitis and 6,000 other invasive Hib infections, such as pneumonia and epiglottitis.

- Percent of children ages 1 through 4 immunized against polio, measles, rubella and mumps declined from 1983 to 1985. Overall, levels of immunization for preschool-age children worsened or showed no improvement between 1980 and 1985.

- In 1979 the Swedish government stopped producing the whole cell pertussis vaccine. Since then, Swedish children have not been vaccinated against pertussis, and in 1982 and 1983 a severe whooping cough epidemic broke out.

- Most of the outbreaks of measles in the U.S. during 1983 were among age groups in which there are a number of unvaccinated individuals. In 1984 the incidence of measles was up 69% from the preceding year, from 1,497 to 2,534 cases. In 1985 the number of cases rose to 2,822, and provisional data for 1986 show an increase to 6,300. Provisional data for 1989 show 16,236 cases and 45 measles-related deaths.

Considerable variations in immunization by race and by income

Cost effectiveness

- A study of Hib vaccination found net savings of $30.7 million for children vaccinated at 18 months.

- A chickenpox vaccine that may be licensed for use in high-risk populations could save $252 million in direct medical costs over a 30-year period. Additional savings would result from the decreased risk of infection in adults.

- From 1963 to 1982, the measles vaccine saved an estimated $5.1 billion in direct and indirect costs.

- A pertussis vaccination program would have prevented more than 92,000 cases and save $44 million in direct medical costs for a hypothetical cohort of one million children.

- Benefit-cost ratio for polio immunization is more than 10:1, saving approximately $1 billion annually.

- Benefit-cost ratio for the MMR (measles, mumps, rubella) immunization program is approximately 14:1.

- In 1984, it was estimated that for every dollar spent on the Childhood Immunization Program, the government saves $10 in medical costs.

- A study by the CDC indicated that the $180 million spent on a measles vaccination program saved $1.3 billion in medical and long-term care by reducing hearing impairment, retardation and other problems.

STUDIES

Reductions in Childhood Diseases Because of Immunization

U.S. Department of Health and Human Services. Centers for Disease Control. Morbidity and Mortality Weekly Report. "Progress Toward Achieving the National 1990 Objectives for Immunization." Journal of the American Medical Association. Vol. 260. November 1988.

> By the end of 1988, the CDC reports that the targets for the incidence of diphtheria and polio-myelitis will be met and substantial progress will have been made toward the targets for the incidence of tetanus, rubella, and congenital rubella syndrome. However, it is unlikely that the immunization goal of at least 90% of all children completing their immunization series by age 2 will be met. Survey data from 1985 indicate that 77% of 2-year-olds whose parents had records at home had received their basic immunizations.
>
> The goal of having at least 95% of children attending licensed daycare facilities and kindergarten through 12th grade fully immunized may be met. For the 1986-87 school year, immunization levels in licensed day-care facilities exceeded 90%. The immunization rate for children entering kindergarten or first grade was 97%.

Medical News and Perspectives. "Expert Panel Convened by FDA Recommends Hemophilus Influenzae Type B Vaccine Should Continue in Use for Children Older Than 2 Years." Journal of the American Medical Association. Vol. 257. June 1987.

> A group of experts called together by the Food and Drug

Administration recommended that children over the age of 2 should continue to be immunized against Hib. Only one study has questioned the efficacy of the vaccination. The article also reported on the development of a new Hib vaccine that appears to be effective in children under the age of 18 months, the group currently most at risk for illness.

Dr. Eugene Shapiro, Yale University of Medicine reported that based on data from two sites, "the vaccination is efficacious among children 24 to 72 months of age." He estimated the efficacy of the vaccination at 89%.

U.S. Department of Commerce. Bureau of the Census. Statistical Abstract of the United States, 1987. Tables 162 and 163.* Statistical Abstract of the United States, 1985. Tables 180 and 181.

In 1985, the percent of children, ages 1-4 immunized against specific diseases stood at 87% for diphtheria-tetanus-pertussis, 75.7% for polio, 76.9% for measles, 73.8% for rubella, and 75.5% for mumps. For children ages 5-14, the percent immunized was 93%, 88.4%, 87.6%, 85.3%, and 87.1% for the specified diseases respectively.

This contrasts with 1983 when the percent of children, ages 1-4 immunized against specific diseases, stood at 86% for diphtheria-tetanus-pertussis, 76.5% for polio, 77.3% for measles, 76.4% for rubella, and 74.4% for mumps. For children ages 5-14, the percent immunized was 92.9%, 89.6%, 88.6%, 88.9% and 86.2% for the specified diseases respectively.

The decrease in reported cases of diseases since early reporting shows the effectiveness of childhood immunizations. In 1960, 918 cases of diphtheria, 14,800 cases of pertussis, and 368 cases of tetanus were reported. In 1982, there were two reported cases of diphtheria, 1,900 of pertussis and 88 of tetanus. Provisional data for 1985 indicate no change in the number of reported cases of diphtheria, and increase in reported cases of pertussis to 3,300, and a slight decline in tetanus to 71 reported cases.

Polio dropped from 3,190 cases in 1960 to eight in 1982 and to five in 1985. Reported cases of mumps also continued to decline from 105,000 in 1970, down to 5,300 in 1982 and 2,900 in 1985. Cases of rubella declined from 56,000 in 1970 to 2,300 in 1982, falling further to about 600 cases in 1985.* Reported cases of

> measles for 1985, while remaining very low compared to levels recorded in 1960 and 1970, rose from 1982 levels. From 1960 to 1982, cases of measles dropped from 441,700 to 1,700; for 1985, 2,700 cases were reported preliminarily.

* Error in 1987 Statistical Abstracts in number of reported rubella cases provisionally reported in 1985. Figures cited here reflect correction provided by Centers for Disease Control.

Johnson, K. Who is Watching Our Children's Health? The Immunization Status of American Children. Washington, DC: Children's Defense Fund. December 1987.

> Examination of immunization status of children found "General levels of immunization for preschool-age children worsened or showed no improvement between 1980 and 1985. For example, the proportion of one- to four-year-olds receiving no doses of polio vaccine rose by 40% for children of all races and 80% for nonwhite children; and the percentage of children who were not immunized against rubella before age five rose during this period...."
>
> "While there is no danger of soon returning to the levels of disease experience before 1970, during the 1980-1985 period the nation experienced a significant increase in the number of reported cases of measles, mumps, and pertussis...."
>
> "The number of cases of measles reported in the U.S. has risen dramatically since 1983, and there were more cases in 1986 than in any year since 1980. Preschool-age children had the highest reported rates in 1985 and 1986. CDC found that 83% of the cases among children age 16 months to four years were preventable through adequate immunization."

Nkowane, B.M., et al. "Measles Outbreak in a Vaccinated School Population: Epidemiology, Chains of Transmission and the Role of Vaccine Failures." American Journal of Public Health. Vol. 77. No. 4. April 1987.

> A study of a measles outbreak in a high school where the documented vaccination level was 98% showed that persons who were not immunized or had received immunization at less than 12 months of age had higher attack rates than those immunized on

or after 12 months of age. "Vaccine failures among apparently adequately vaccinated individuals were sources of infection for at least 48% of the cases in the outbreak....The outbreak subsided spontaneously after four generations of illness in the school and demonstrates that when measles is introduced in a highly vaccinated population, vaccine failures may play some role in transmission but that such transmission is not usually sustained."

White, C.C., et al. "Benefits, Risks and Costs of Immunization for Measles, Mumps and Rubella." American Journal of Public Health. Vol. 75. No. 7. July 1985.

Researchers compared the actual and estimated morbidity, mortality, and costs attributable to measles, mumps, and rubella with having or not having a childhood immunization program. "Without an immunization program, an estimated 3,325,000 cases of measles would occur as compared to 2,872 actual cases in 1983 with a program. Instead of an expected 1.5 million rubella cases annually, there were only 3,816 actual cases. Mumps cases were lowered from an expected 2.1 million to 32,850 actual cases. There are comparable reductions in disease-associated complications, sequelae, and deaths."

"Without a vaccination program, disease costs would have been almost $1.4 billion. Based on the actual incidence of disease in 1983, estimated costs were $14.5 million. Expenditures for immunization, including vaccine administration costs and the costs associated with vaccine reactions, totaled $96 million. The resulting benefit-cost ratio for the MMR immunization program is approximately 14:1. The savings realized due to the use of combination rather than single antigen vaccine total nearly $60 million."

U.S. Department of Health and Human Services. Centers for Disease Control. Rubella and Congenital Rubella -- United States, Reports for 1980-83; 1983-84. Cited in Morbidity and Mortality Weekly Report. "Elimination of Rubella and Congenital Rubella Syndrome -- United States." Vol. 34. February 1985.

Rubella vaccine was licensed in 1969, and more than 123 million doses of the vaccine have been given since then, "successfully preventing epidemics of rubella and congenital rubella syndrome (CRS) from occurring in the U.S. Compared to pre-vaccine years,

> the number of reported cases has decreased 98.7% overall, with 90% or higher declines recorded for all age groups."

Uneven Immunization

National Head Start Association. Head Start: The Nation's Pride. A Nation's Challenge. Recommendations for Head Start in the 1990's. The Report of the Silver Ribbon Panel. Washington, DC. 1990.

> Reviews of Head Start show that 98% of children enrolled in Head Start had completed all of the required immunizations or were up-to-date in their immunizations.

Miller, C.A., et al. Monitoring Children's Health. Key Indicators. 2nd edition. Washington, DC: American Public Health Association. 1989.

> "Immunization levels in large urban areas remain below the levels in other areas. Among all one- to four-year olds living in large cities, approximately one-fourth did not receive measles, mumps, or rubella vaccine in 1985. Among nonwhite one- to four-year olds living in big cities, approximately one-third were not vaccinated for meales, mumps, or rubella. Evidence suggests that the high proportion of unimmunized children in large cities reflects poor access to basic health services and that disparities between white and nonwhite children are linked to economic status. Survey data indicate that nonwhite children and children whose families are of low socioeconomic status are at increased risk of being unimmunized."

Johnson, K. 1987. op. cit.

University of North Carolina (UNC) Child Health Outcomes Project. Monitoring the Health of America's Children: Ten Key Indicators. September 1984.

> National Center for Health Statistics data show percent of preschool children "who are adequately immunized against childhood disease varies greatly by race and income. In 1981, the portion of white preschoolers immunized was 10 to 21 percentage points higher than the portion of nonwhites immunized (percent varies by disease for which immunization given). Similarly, in

1979, the portion of poverty-area, central-city preschoolers who were immunized ranged from 12 to 20 percentage points below the portion of nonpoverty, noncentral-city preschool children immunized."

U.S. Department of Health and Human Services. Administration for Children, Youth and Families. Project Head Start. Performance Indicator Report System. Annual Report for School Year Ending 1983. Washington, DC: U.S. Department of Health and Human Serivces. 1983. Cited in UNC Child Health Outcomes Project. Monitoring the Health of America's Children: Ten Key Indicators. September 1984.

"In contrast to the trend for most low-income children, preschoolers participating in the Head Start program have higher than average immunization rates. For program year ending 1983, 93.5% of children in the Head Start program nationwide had complete or up-to-date immunization."

Continued Threat of Disease in Absence of Immunization

"Pertussis Vaccine Encephalopathy: It Is Time to Recognize It as the Myth That It Is." Journal of the American Medical Association. Vol. 263. March 23/30, 1990.

Concern over possible linkages between pertussis vaccine and permanent neurological illness has led some parents to withhold this vaccine from their children. This editorial reports the findings of three controlled studies involving 230,000 children and 713,000 vaccinations that found no evidence of a causal relationship between the vaccine and neurological damage. There was also no causal association found between pertussis immunization and infantile spasms.

Funkhouser, A.W., et al. "Estimated Effects of a Delay in the Recommended Vaccination Schedule for Diphtheria and Tetanus Toxoids and Pertussis Vaccine." Journal of the American Medical Association. Vol. 257. March 13, 1987.

Fear over potential adverse side effects from the pertussis vaccine has led to a consideration of delaying the vaccination schedule currently in effect. The authors developed a model to test the possible outcomes of delaying vaccination from two, four and six months to eight, ten and twelve months of age. They forecast that such a delay would result in "an additional 636 cases of pertussis -- 115 of which would be associated with complications, including two encephalopathies." The researchers also projected that there would be "353 fewer chance associations with sudden infant death syndrome (SIDS) but 1,311 more chance associations between DPT and seizures. These estimates suggest that the current schedule of vaccinating infants at two, four, and six months of age is causally associated with less morbidity and should be continued.

Johnson, K. 1987. op. cit.

U.S. Department of Health and Human Services. Centers for Disease Control. "Measles -- United States, 1986." Morbidity and Mortality Weekly Report. Vol. 36. No. 20. May 29, 1987.

Centers for Disease Control reported that the provisional total of 6,273 cases of measles for 1986 "represents a 2.2-fold increase over the 2,822 cases reported in 1985, but is still 98% below the reported incidence in prevaccine years." According to a CDC review of detailed information on 6,255 of the cases, 36.4% were classified as preventable. "The highest proportion of preventable cases occurred among persons who were not of school age: 83.2% of cases among children 16 months - 4 years of age were preventable, as were 72.2% of cases among persons 20-29 years of age. In contrast, 29.4% of cases among school-aged persons (5-19 years of age) were preventable."

It was further noted that "since measles vaccine was licensed in 1963, the incidence of measles has declined to approximately 1%-2% of that reported in the prevaccine era. However, increases in the number of reported cases have occurred annually since the record low in 1983, when 1,497 cases were reported. There were more cases in 1986 than in any year since 1980, when 13,506 cases were reported."

U.S. Department of Health and Human Services. Centers for Disease Control. Measles -- United States, 1984. Morbidity and Mortality Weekly Report. Vol. 34. No. 21. May 31, 1985.

> Centers for Disease Control reported 69% increase in cases from 1983 through 1984. Reported measles cases rose from 1,497 in 1983 to 2,534 in 1984. 874 -- 34% -- of last year's cases were classified as preventable.

Koshland, D.E. "Benefits, Risks, Vaccines, and the Courts." Science. (editorial) Vol. 227. No. 4692. March 15, 1985.

> "When DPT vaccine fell into disuse in England and Japan during the 1970's the death rate shot up (for example, during one 2-year period in England 36 children died per 100,000 who were infected with whooping cough)."

Sun, M. "Whooping Cough Vaccine Research Revs Up." Science, Vol. 227. March 8, 1985.

> In 1979 the Swedish government stopped producing the whole cell pertussis vaccine, and since then, Swedish children have not received pertussis vaccination. In 1982 and 1983, a severe whooping cough epidemic broke out.

American Public Health Association. "Incidence of Measles Fell Again in 1983." The Nation's Health. 14(Apr): 4. Cited in UNC Child Health Outcomes Project. Monitoring the Health of America's Children: Ten Key Indicators. September 1984.

> "Most of the outbreaks of measles during 1983 were among preschoolers under age 5 or among college students -- age groups in which there are a number of unvaccinated individuals since they have not been caught in the push to ensure all school children are immunized."

Cost Effectiveness

U.S. Department of Health and Human Services. Centers for Disease Control. Justification of Appropriation Estimates for Committee on Appropriations. FY 1991.

> The CDC reports that the appropriate administration of safe and effective vaccines remains the most cost-effective method of preventing human suffering and reducing economic costs resulting

from vaccine-preventable diseases. The goals of the immunization program are to eliminate indigenous wild-virus poliomyelitis, measles, rubella and congenital rubella syndrome and to substantially reduce the health burdens caused by mumps, childhood meningitis, diphtheria, pertussis, and tetanus. Beginning in 1990, CDC has added to this list a reduction in perinatal transmission of hepatitis B.

The CDC estimates that "23,100 cases of mental retardation have been averted and 7,100 children's lives have been saved because of measles immunizations." The report cites findings that the benefit-cost ratio of measles, mumps and rubella vaccine is more than 14:1 and for polio immunization is more than 10:1. The estimated savings is approximately $1 billion per year for polio and $500 million per year for measles.

Hay, J., et al. "Cost-benefit analysis of Hemophilus Influenzae Type b Prevention: Conjugate Vaccination at Eighteen Months of Age." The Pediatric Infectious Disease Journal. Vol. 9. April 1990.

The authors report that in the absence of vaccination, there would be 17,361 cases of invasive Hib disease in the 1988 birth cohort during their first 60 months of life. The economic costs of Hib disease among these children would be $2.546 billion (1988 dollars). If 60% of these children were vaccinated at 18 months (assuming 81% effectiveness), it would save $207.1 million ($88.22 savings/vaccinee) and the benefit-cost ratio would be 3.57/1.

U.S. Department of Health and Human Services. Centers for Disease Control. Communications regarding current costs of immunization. August 1990, December 1987 and August 1985.

Currently, the federal contract price of a full immunization series is approximately $76.47. This includes the cost of vaccine (4 doses of polio vaccine @ $1.92/dose; 5 doses of DPT @ $6.91/dose; 2 doses of MMR @ $14.71/dose and 1 dose of Hib @ $4.80/dose). Program operation costs are estimated at $3 per immunization, approximately one-half of the cost of the series.

In 1988, the federal contract price of a full immunization series was approximately $57. This includes cost of vaccine (4 doses of polio vaccine @ $1.43/dose; 5 doses of DTP @ $7.70/dose; and 1 dose of MMR @ $10.67/dose). The Hib vaccine, given at 18 or

24 months of age, costs $2.17/dose.

In 1985, the cost of the series was approximately $31. This included cost of vaccine (4 dose of polio vaccine @ $.804/dose; 5 doses of DTP @ $2.21/dose; and 1 dose of MMR @ $6.85/dose), and program operation costs which were approximately one-third of total cost per series.

Chaiken, Barry P., et al. "The Effect of a School Entry Law on Mumps Activity in a School District." Journal of the American Medical Association. Vol. 257. May 1987.

The authors studied the impact of New Jersey's 1978 mumps "new entrants" school immunization law in the Egg Harbor Township school district in Atlantic County, New Jersey, which suffered from a mumps outbreak in the last quarter of 1983. The researchers found that sixth graders, the last cohort of students not requiring vaccination before enrolling in school, were seven times more likely to be susceptible to mumps in one school.

The researchers calculated the total cost to the affected households at $4,687, an average of $102 per household, which included the cost of medical visits, medication and lost workdays. The school district did not lose state aid for the 362 pupil school days lost. However, this would be an added cost in those states (such as New York) where state reimbursement rates are based on average daily attendance.

U.S. Congress. Office of Technology Assessment (OTA). Healthy Children. Investing in the Future. Washington, DC: Government Printing Office, 1987.

The OTA examined the research on the cost-effectiveness of immunization programs, including the impact of the dramatic increase in the cost of vaccine. "(A) 1984 cost-effectiveness study assumed that the cost of pertussis vaccine was $0.03 per dose, and found the ratio of savings in direct medical costs to the costs of a pertussis vaccination program to be 11.1 to 1....In 1987, the Federal Government paid $7.69 per dose of pertussis...and the private sector price was $8.92." As a result, the ratio of savings dropped from 11.1:1 to 1.29:1 at the government price and to 1.13:1 at the private sector price.

Hib infection accounts for an estimated 12,000 cases of bacterial meningitis and 6,000 other invasive Hib infections, such as pneumonia and epiglottitis.

A study of Hib vaccination (at 18 months) estimated net savings in societal medical care costs at $30.7 million compared with a savings of only $1.1 million for vaccination at 24 months of age.

A new chickenpox vaccine that may be licensed for use in high-risk populations could produce a "net savings of $252 million in direct medical costs."

White, C.C., et al. 1985. op. cit.

UNC Child Health Outcomes Project. 1984. op. cit.

Report summarizes several studies concerning cost effectiveness:

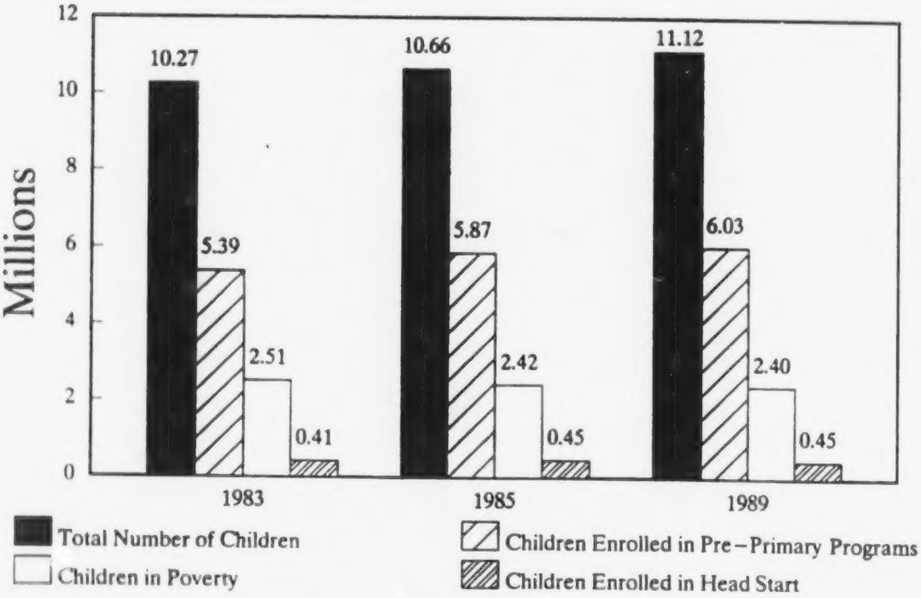
> "For every dollar spent on the Childhood Immunization Program, the government saves $10 in medical costs. For one million 2-year-olds, rubella vaccination would save $9.8 million in net medical costs and an additional $7.4 million in lost productivity. The cost of lifetime institutional care for a child left retarded by measles is between $500,000 and $1 million. Centers for Disease Control study indicated that the $180 million spent over several years on a measles vaccination program saved $1.3 billion in medical and long-term care by reducing hearing impairment, retardation and other problems."

At government contract prices, the total cost for vaccines necessary to complete a series of immunizations in a child...was less than $10 in 1983.

Kaplan, J.P. and White, C.C. An update on the benefits and costs of measles and rubella immunization. In proceedings of the symposium, "Conquest of agents that endanger the brain." Baltimore, MD, October 28-29, 1982. Cited in Morbidity and Mortality Weekly Report. Vol. 34. No. 5. February, 1985.

It is estimated that each case incurs an average lifetime cost of more than $200,000.

Preschool Education
Children Ages 3-5



Sources: U.S. Department of Commerce. Bureau of the Census.

U.S. Department of Health and Human Services. Administration for Children, Youth, and Families. Head Start Bureau.

Note: Projected Head Start enrollment by December 1990 is 550,000, based on supplemental appropriation.

PRESCHOOL EDUCATION

The number and array of preschool education programs, aimed at meeting developmental and educational needs of preschool children and enhancing the likelihood of later school success, have grown dramatically in recent years. This review covers a broad array of early intervention and preschool education programs, including Head Start, which was established in 1965 as a nationwide program providing enriched early childhood education for low-income children. Head Start also provides a range of other services, including health, nutrition and social services. The program emphasizes parent and community involvement in the development and operation of the program. Head Start is authorized under P.L. 99-425.

By 1988, 28 states were funding pre-kindergarten early childhood education programs. As of May 1988, eight states were providing supplemental funds to Head Start programs.

Evaluations of Head Start and other comprehensive early childhood education programs have examined both the short- and long-term effects of participation on low-income children and their families.

Research on the effects of early childhood education over the past 25 years documents the following

Increased school success of children who attended preschool compared with children who had not

- Better grades, fewer failing marks, lower retention in grade, and fewer absences in elementary school
- Less need for special education services and fewer placements in special education classes
- Improved literacy and curiosity in school
- Greater likelihood of completing high school
- Greater likelihood of continuing education beyond high school

Increased employability

Decreased dependence on public assistance

Decreased criminal activity

Improvement in students' self-confidence, self-esteem and expectations

Positive effects for parents and families

- Improved parenting skills
- Increased educational attainment
- Improved coordination of social services

Cost effectiveness

- Researchers calculated that $39,278 in benefits could be achieved including $7,005 savings in public education, $22,490 savings in welfare benefits, $4,252 savings in reduced costs to the criminal justice system, and a $6,495 bonus in increased taxes collected.
- Researchers project that if an additional $16.6 billion were spent on quality preschool programs, the expected annual return to taxpayers could be $56.2 billion.

STUDIES

Increased School Success

Martin, S., et al. "The Prevention of Intellectual Impairment in Children of Impoverished Families: Findings of a Randomized Trial of Educational Day Care." American Journal of Public Health. Vol. 80. July 1990.

> The researchers evaluated the effects of child care program -- the Carolina Abecedarian Project -- on the intellectual development of high-risk children for four and one-half years. Children entered the Abecedarian Project between 6 and 12 weeks of age and attended 50 weeks a year. The program was specifically designed to promote social and cognitive growth. The mothers of the children enrolled in the study tended to be young, have low IQs and low education levels.
>
> Mean IQ scores of the children enrolled in the program were consistently higher than those of children who did not participate

in the special program. The positive impact of educational day care was especially pronounced for the children whose mothers had mental retardation.

The Infant Health and Development Program. "Enhancing the Outcomes of Low-Birth-Weight, Premature Infants." Journal of the American Medical Association. Vol. 263. June 1990.

The Infant Health and Development Program, the largest randomized study of intensive early childhood intervention, evaluated the effectiveness of early child development and family support services combined with pediatric follow-up in reducing developmental, behavioral, and other health problems related to low birthweight babies. The intervention group participated in three different services: home visits, child development and parent group meetings. The home visitor provided health and development information, a cognitive and social curriculum and a systematic approach for parents to manage self-identified problems. Children ages 1 to 5 attended the child development centers five days a week. Transportation was available. Parents met in group sessions on a bimonthly basis. Children who received the intervention experienced: "(1) significantly higher IQ scores; (2) significantly fewer maternally reported behavior problems; and (3) a small, but significant increase in maternally reported minor morbidity, with no evidence of an increase in reported serious health problems.

Lee, V., et al. "Are Head Start Effects Sustained? A Longitudinal Followup Comparison of Disadvantaged Children Attending Head Start, No Preschool, and Other Preschool Programs." ERIC ED 309 880. May 1989.

This research investigated the sustained effects of Head Start for disadvantaged, black children in kindergarten and first grade compared to other disadvantaged children with other or no preschool experience. The researchers tested 646 children on their verbal achievement, perceptual reasoning and social competence. At the end of kindergarten, children who had participated in Head Start programs scored significantly higher on the California Preschool Competency Test (which tests for social competence) than those children who did not attend preschool. While other results did not reach statistical significance, the direction of the outcomes favored children with Head Start experience.

Gotts, E.E. Hope, Preschool to Graduation: Contributions to Parenting and School-Family Relations Theory and Practice. AEL Final Report. Charleston, WV: Appalachia Educational Laboratory. February 1989.

From 1968 through 1971, AEL conducted an experimental program, Home-Oriented Preschool Education (HOPE), as an alternative to kindergarten in rural West Virginia, Alabama, Ohio, Tennessee and Virginia. The program consisted of daily television lessons, weekly paraprofessional home visits and a weekly group experience for the children.

Performance gains were documented at the preschool level in early concept development, perceptual-motor functions, vocabulary and psycholinguistic abilities. The home visitation component increased these gains. Primary grade records indicate improved attendance, higher grade point averages and increased objective test scores on achievement and ability.

Children in the control group were more than two times as likely to have failed a grade than were children in the experimental group. The high school dropout rate for the control group was more than double that of the experimental group. Favorable effects of HOPE on school-family relations were detectable 12-14 years after the families participated in the program.

The HOPE study suggests an estimated cost benefit in excess of $8 million in anticipated increased earnings for the 73 dropouts that were prevented.

Lally, J.R., et al. "The Syracuse University Family Development Research Program: Long-Range Impact of an Early Intervention with Low-Income Children and Their Families." Powell, D.R. (ed.) Parent Education as Early Childhood Intervention: Emerging Directions in Theory, Research, and Practice. Norwood, NJ: Ablex. 1988.

According to a follow-up study ten years later, an extensive program of day care and family services over the first five years of children's lives resulted in a reduction in rate of delinquency in adolescence and higher expectations about further education among all program participants, and better academic performance among participating girls. Children of the low-income families who participated had a 6% rate of juvenile delinquency, compared to a 22% rate for children in a control group. Moreover, the offenses committed by children in the control group were considerably more severe, including burglary, robbery, and physical and sexual assault, unlike the experimental group. The study estimated that administrative and detention costs associated with the cases were $12,000 for the program group and $107,000 for the control group.

Compared to control-group children, program group children also were more likely to expect education to be a continuing part of their lives: 53% of the program group but only 28% of the controls anticipated they would be in school in the next five years. Effects on academic achievement were seen significantly among girls: Three-fourths of the program group girls had C averages or better, none was failing, and none had more than 20 school absences during the previous years. In contrast, more than one-half of the controls had averages below C; 16% were failing; and 31% had more than 20 absences.

Lee, V., et al. "Does Head Start Work? A 1-Year Follow-Up Comparison of Disadvantaged Children Attending Head Start, No Preschool, and Other Preschool Programs." Developmental Psychology. Vol. 24. 1988.

The researchers compared 969 disadvantaged children attending Head Start, other preschool, or no preschool. After one year in the program, Head Start participants gained significantly more than students in either the "No Preschool" or "Other Preschool" comparison groups on three measures -- the Peabody Picture Vocabulary Test, the Caldwell Preschool Inventory and Motor Inhibition. On a fourth measure, the Head Start students gained significantly more than children with no preschool experience, but less than children with other preschool experience.

Copple, C.E., et al. Path to the Future: Long-Term Effects of Head Start in the Philadelphia School District. Washington, DC: U.S. Department of Health and Human Services. Administration for Children, Youth and Families. Head Start Bureau. 1987.

This study examined children in the Head Start/Follow Through programs and followed them in grade school in 33 schools in Philadelphia from 1970 to 1979. The project's results replicate and extend findings from other studies, namely, that compared with control children, Head Start children more often avoided serious school problems, were less frequently retained, had better attendance rates and missed fewer standardized tests. While immediate gains were not sustained on a long-term basis, Head Start graduates were more likely to maintain a relatively positive and consistent relationship with their schools. The authors conclude that the long-term impact of Head Start is in reducing school failure.

Resnick, M., et al. "Developmental Intervention for Low Birth Weight Infants: Improved Early Developmental Outcome." Pediatrics. Vol. 80. No. 1. July 1987.

Study evaluated the effects of a multidisciplinary infant development program on the mental and physical development of low birthweight infants in a neonatal intensive care center. Home-based services were provided to the experimental group up to the age of two and consisted of bimonthly visits, appropriate referrals, parent counseling, and a developmental curriculum for social, visual, auditory, language, memory, perceptual motor and physical development. The experimental group experienced a 4% prevalence of developmental delay at both 1 and 2 years of age as compared to an 18% prevalence and a 26% prevalence of developmental delay at one and two years, respectively, for a control group that did not receive the intensive developmental services. At one year adjusted age, the experimental group scored significantly higher on mental and physical development.

Schweinhart, L.J. Testimony before the California State Senate Select Committee on Infant and Child Care and Development. October 29, 1987.

Schweinhart testified that high-quality preschool programs for children who live in poverty help to prevent school failure, dropping out of school, juvenile delinquency, and illiteracy, and in the long run, save taxpayers considerably more than they originally cost. Follow-up studies of participants in the Perry Preschool Program at age 19 found that preschool participation had increased the percentage of persons who were literate, employed, and enrolled in post-secondary education, whereas it had reduced the percentages who were school dropouts, labeled mentally retarded, on welfare, or arrested for delinquent and criminal activity. This effort, combined with other early intervention research, shows that high-quality, early childhood programs prepare poor children better for the intellectual and social demands of schooling, and that preschool participation can lead to greater success and social responsibility in adult life. The cost/benefit analysis showed a six-fold return on one-year programs and a three-fold return on two-year programs. For a cost of $5,000 per participant, total benefits to taxpayers from the program were about $28,000 per participant.

Horacek, H.J., et al. "Predicting School Failure and Assessing Early Intervention with High-Risk Children." Journal of the American Academy of Child and Adolescent Psychiatry. Vol. 26. No. 5. 1987.

> Study of school performance of 90 children identified at birth as being at high risk for school failure based on social and economic variables found that high-risk children experienced 3.8 times the rate of grade failure (50%) of their average-risk peers (13%); educational intervention reduced the incidence of grade failure most successfully when delivered as both a preschool and a school-age program; and achievement test scores in reading and math show a parallel beneficial effect from intervention."

Hubbell, R.M., et al. The Impact of Head Start on Children, Families and Communities. Final Report of the Head Start Evaluation, Synthesis and Utilization Project. Washington, DC: U.S. Department of Health and Human Services. Administration for Children, Youth and Families. Head Start Bureau. 1985.

> An analysis of 210 reports of research on the effects of local Head Start programs concludes that children enrolled in Head Start enjoy significant immediate gains in cognitive test scores, socioemotional test scores and health status. While in the long run, cognitive and socioemotional test scores may not remain superior to those of disadvantaged children who did not attend Head Start, former Head Start students are more likely to be promoted to the next grade and are less likely to be assigned to special education classes.

"South Carolina: Plan for Early Childhood Development and Education." Interagency Coordination Council for Early Childhood Development and Education, Office of the Governor. South Carolina. 1986. And, Taylor, J. "Early Childhood Education Programs in South

Carolina's Public Schools." South Carolina Department of Education. November 27, 1985.

> The Half-Day Child Development Program for Four-Year-Olds in South Carolina, created under the state's Education Improvement Act of 1984, provides for half-day child development programs for 4-year-olds, "focusing on areas with a significant number of students scoring 'not ready' on a first grade readiness test." The efforts so far have shown positive effects on the preparedness of first graders: The number considered ready for school has risen from 60% in 1979 to 75% in 1985; those reading at grade level increased by 16%, and third graders tested in 1985 showed an almost 30% increase over 1979 scores; math scores showed a 20% increase from 1981 to 1985.

Pfannenstiel, J.C. and Seltzer, D.A. "New Parents as Teachers Project: Evaluation Report." Missouri Department of Elementary and Secondary Education. 1985.

> The Parents as Teachers Program in Missouri supports parents in their role as children's first teachers and is designed to prevent failure in school and promote the well-being of families. Results of independent evaluation show that program children score significantly higher on all measures of intelligence, achievement, comprehension, and verbal and language ability. Their scores ranked at the 75th percentile in mental processing and at the 85th percentile in school-related achievement, compared to the comparison group which scored at the 55th and 61st percentiles, respectively; parents were more knowledgeable about childrearing practices and child development than the comparison group; parents and children performed well regardless of demographic or economic status; and program staff were successful in intervening and helping to improve at-risk situations.

Reece, C. "Head Start at 20." Children Today. Vol. 14. No. 2. March-April 1985.

> Discussion of Head Start program as it begins its 20th year of operation states
>
> > "The findings are clear. Head Start produces substantial gains in children's cognitive and language development, school readiness and achievement. Head Start children are

far less likely to be held back a grade or assigned to a special education class than similar children who did not attend Head Start, and Head Start children have been found to be more sociable and assertive than comparable youngsters. Children in Head Start obtain markedly higher levels of health care than children not in the program, have fewer absences from school and perform better on physical tests. In many studies, parents of Head Start children report important changes in their educational or economic status leading to greater family self-sufficiency."

Deutsch, M., et al. "Long-term Effects of Early Intervention: Summary of Selected Findings." Unpublished paper. March 1985. Also reported in The New York Times. April 1985.

Study found short- and long-term benefits of enriched preschool program for inner-city, poor children. Program participants showed significant changes in literacy, curiosity, and improved orientation to general environment; 58% of the program participants finished high school compared to 40% of controls; 39% of participants went on to college or specific vocational training compared to 28% of controls; and 49% of program participants obtained employment compared to 24% of the controls. Based on results of interviews and personality assessments, program participants showed greater initiative, assertiveness, self-esteem, and ego strength.

Pierson, D., et al. "A School-Based Program from Infancy to Kindergarten for Children and their Parents." Personnel and Guidance Journal. Vol. 62. No. 8. April 1984.

The Brookline, Massachusetts Early Education Project, a school-based program lasting from infancy to kindergarten for children and their parents, provided parent education and support, diagnostic monitoring and education programs for children. Evaluation of children in the second grade who had participated in the program as preschoolers found that program children were one-half as likely as the comparison group to experience difficulty in learning during second grade, and program parents initiated 40% more contacts with second grade teachers than comparison group parents.

Berreuter-Clement, J., et al. Changed Lives. The Effects of the Perry Preschool Program on Youths through Age 19. Monographs of the High/Scope Educational Research Foundation. Number Eight. Ypsilanti, MI. 1984.

> The Perry Preschool Study shows that an enriched early childhood education proves school success; increases employability and lowers need for public welfare; helps to prevent criminal activity and is exceptionally cost effective. With regard to school success, persons who had attended preschool had better grades, fewer failing marks, and fewer absences in elementary school; they required fewer special education services and were more likely to continue their education or get vocational training than their no-preschool counterparts.
>
> By age 19, the preschool group's employment experience was significantly better than the experience of the no-preschool groups. Study participants who attended preschool were more likely to be employed at the time of the age 19 interview, and they were employed more months of the calendar year in which they became 19.
>
> Researchers calculated that the value of benefits beyond age 19 of participants exceeds seven times the cost for one year of preschool (in 1981 dollars). They estimate that a $1 investment in preschool education returns $6 in taxpayer savings because of lower special education costs, lower public welfare costs, higher worker productivity and lower costs of crime (Tables 26 and 27).

Weikart, D. Testimony at hearing, Prevention Strategies for Healthy Babies and Healthy Children. Select Committee on Children, Youth, and Families. U.S. House of Representatives. Washington, DC. June 30, 1983.

> Testimony reported findings of the High/Scope Perry Pre-school Project, indicating a higher rate of school success and employment, as well as lower arrest rate and lesser likelihood of appearing on welfare rolls. A summary of the cost-benefit analysis states
>
> > "For every dollar invested in one year of high quality pre-school education for economically disadvantaged children, the returns to society over the lifetime of the subject are approximately: $1 in reduced public school education costs; 50 cents in reduced crime costs; 25 cents in reduced cost

of welfare administration (in addition $2.25 in reduced taxpayer's cost of welfare); and $3 in increased lifetime earnings (75 cents in increased tax revenues)....Return on investment to society for each $1 is $4.75."

Lazar, I., et al. Lasting Effects of Early Education. Monographs of the Society for Research in Child Development, 47 (2-3, Serial No. 195). 1982.

Study of the long-term effects of early childhood education experience on children from low-income families, based on secondary analyses of data from several preschool programs. Results indicate effects in a number of areas: School competence, developed abilities, children's attitudes and values, and impact on the family. Findings include the following:

Children who attended programs were significantly more likely to meet their school's basic requirements;

Across six programs whose data could be pooled for the analysis, there was a significantly lower rate of assignment to special education among children in the early intervention group (13.8%), compared to the control group (28.6%);

Across eight projects, the program group had a lower median rate of grade retention of 25.4% compared to 30.5% in the control group;

Program participants surpassed controls on IQ tests for several years after the program had ended;

Children who had attended early education programs were significantly more likely than were controls to give achievement-related reasons, such as school or work accomplishments, for being proud of themselves;

Across all projects, mothers of program graduates were more satisfied with their children's school performance than were mothers of control children. Mothers of program participants also had higher aspirations for their children.

In one state, program families were less likely to use foster care services.

Ziegler, E., et al. Project Head Start. New York: The Free Press. 1979.

> Review of the history and effects of Head Start after 13 years of program operation in 1979. It summarizes aspects of Head Start's success as follows:
>
> > "At the simplest level, it has provided nutritious meals, vaccinations, and dental care to children who would otherwise not have had them. The improved physical health of Head Start children is a concrete, exciting, and too often ignored accomplishment.
> >
> > "Many studies of Head Start have focused on the intellectual and academic development of those children who participated, disregarding the children's social and emotional development or the program's impact on communities. Repeated educational evaluations of Head Start have left no doubt that it has striking short-term affects on children's social and cognitive development.
> >
> > "Parents who participated in Head Start were able to exercise control over their own lives by influencing decisions about the care of their children. Many parents gained career training and even employment. Others learned how to affect political institutions. According to the parents' own testimony, their improved self-esteem changed their relations to their children and their communities."

Increased Employability

Schweinhart, L.J. 1987. op. cit.

Deutsch, M., et al. 1985. op. cit.

Berreuter-Clement, J., et al. 1984. op. cit.

Reduced Delinquency and Dependence on Public Assistance and in Reports of Criminal Activity

Lally, J.R., et al. 1988. op. cit.

Schweinhart, L.J. 1987. op. cit.

Farnworth, M., et al. "Preschool Intervention, School Success and Delinquency in a High-Risk Sample of Youth." American Educational Research Journal. Vol. 22. Fall 1985.

> Based on data gathered by the Perry Preschool project, researchers assessed the delinquent behavior of 125 teenagers identified at ages 3 and 4 as being at high risk of school failure. One-half of the students were assigned to an intensive preschool intervention program, the other half were not. The researchers found that low IQ and achievement scores did not predict delinquent activity by age 15, but found that preschool intervention reduced involvement in two types of delinquency (dishonesty and escape).

Berreuter-Clement, J., et al. 1984. op. cit.

Weikart, D. 1983. op. cit.

Improvement in Students' Views of Themselves; Increased Maternal Satisfaction

Lally, J.R., et al. 1988. op. cit.

Lazar, I., et al. 1982. op. cit.

Positive Effects for Parents and Family

National Head Start Association. Head Start: The Nation's Pride. A Nation's Challenge. Recommendations for Head Start in the 1990's. The Report of the Silver Ribbon Panel. Washington, DC. 1990.

> Reviews of Head Start show that in 1988-89: (1) 99% of children enrolled in Head Start 90 days or more completed medical screening; (2) 98% of those identified as needing treatment received it; (3) 98% had completed all of the required immunizations or were up-to-date in their immunizations; (4) more than 35% of the staff were parents of current or former Head Start children, and more than 443,000 parents volunteered in their local Head Start programs.

The Infant Health and Development Program. 1990. op. cit.

Oyemade, U., et al. "The Relationship Between Head Start Parental Involvement and the Economic and Social Self-Sufficiency of Head Start Families." Journal of Negro Education. Vol. 58. 1989.

> The researchers examined the impact of parental involvement on Head Start families. They found that fewer families were receiving public assistance at the end of their Head Start experience than at the beginning. More parents had earned college credit or degrees. Parents who were more actively involved were significantly more likely to be employed and to have incomes above the poverty level.

Gotts, E.E. 1989. op. cit.

Seitz, V., et. al. "Effects of Family Support Intervention: A Ten-Year Follow-up." Child Development. Vol. 56. 1985.

> Analysis of the long-term outcomes of a comprehensive, 30-month family support intervention program for first-born, healthy babies from families with incomes below the poverty level revealed that, when compared with a control group, (1) the experimental mothers had completed significantly more years of education than had the control mothers; (2) the children in the experimental

> group missed significantly less school -- 7.3 days as compared to 13.3 days for the control group.
>
> On the average, boys in the control group received school services costing $1,570 above the regular cost per pupil, while for the experimental group, the extra cost of services averaged $450 per child.
>
> The cost of the experimental program was $20,000 measured in 1982 dollars for the full period of intervention. The authors estimate costs for the control group at approximately $40,000 per family.

Reece, C. 1985. op. cit.

Lazar, I., et al. 1982. op. cit.

Zigler, E., et al. 1979. op. cit.

Cost Effectiveness

Barnett, W.S. and Escobar, C.M. "Economic costs and benefits of early intervention," in Handbook of Early Childhood Intervention, Shonkoff, J.P. and Meisels, S.J. (eds.) Cambridge, England: Cambridge University Press, 1990.

> Analysis of early intervention studies shows that early intervention for disadvantaged children and their families can be a sound economic investment. Home-based programs are a low-cost option that appear particularly effective as early intervention programs for infants. More expensive programs, such as the Yale Family Support program, generate substantial long-term economic benefits to parents as well as children.

Schweinhart, L.J. and Weikart, D.P. "The High/Scope Perry Preschool Study, Similar Studies, and Their Implications for Public Policy in the United States," in Early Childhood Education: Policy Issues for the 1990s. Stegelin, D. (ed.) Norwood, NJ: Ablex (In Press).

> The Perry Preschool Program returned $3.00 for every $1 invested in the 60-week program for 3- and 4-year old children and $5.95 for every $1 invested in the 30-week program for 4-year olds. Authors report that $14.9 billion is currently being spent in public and private funds for early childhood programs. They suggest that if an additional $16.6 billion were spent on quality early childhood programs for both part-time and full-time programs, and the programs were as cost-effective as the Perry Preschool Project, then the return to taxpayers would be $56.2 billion. The $31.5 billion price tag for good early childhood programs compares to a national expenditure of $11.5 billion per grade level in public schools.

Gotts, Edward Earl. 1989. op. cit.

Lally, J.R., et al. 1988. op. cit.

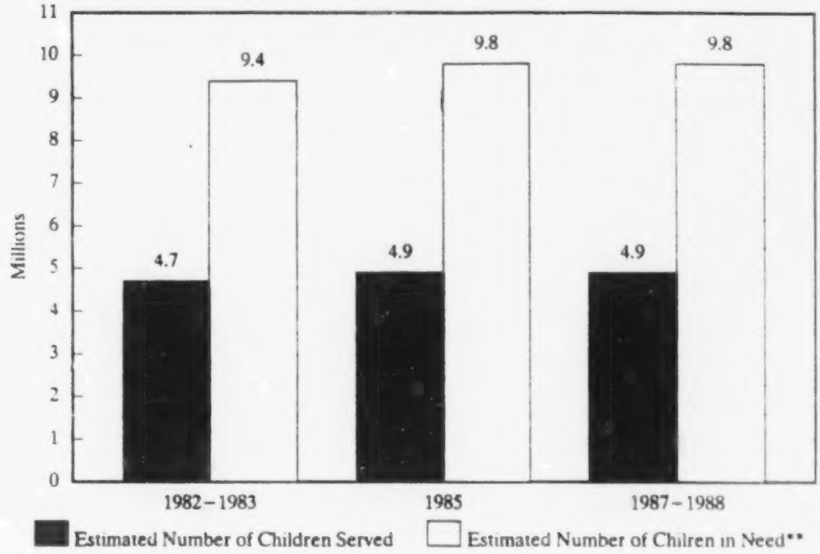
Schweinhart, L.J. 1987. op. cit.

Seitz, 1985. op. cit.

Berreuter-Clement, J., et al. 1984. op. cit.

Weikart, D. 1983. op. cit.

Compensatory Education*
Participation



* CHAPTER 1 - LEA GRANT PROGRAM for educationally disadvantaged pupils at preschool, elementary, and secondary levels of education.

** Calculation based on estimated 50% of eligible served. Alternative methods for calculating children in need are based on the federal allocation formula, which yields 8.0 - 8.1 million in need for 1987-1989, and on the number of children below the 25th percentile in reading and math, yielding 11.35 million children in 1988.

Sources: U.S. Department of Education, Chapter 1 Office; Congressional Research Service.

COMPENSATORY EDUCATION

Title I of the Elementary and Secondary Education Act of 1965 was the federal government's premier effort to provide compensatory education services to educationally disadvantaged and low-income students. The program was substantially revised and became Chapter 1 of the Education Consolidation and Improvement Act. The Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988 amended and reauthorized Chapter I through FY 1993.

More than 4.9 million students received Chapter 1 services during the 1987-88 school year. Forty percent of children scoring at or below the 25th achievement percentile are served by Chapter 1. More than 90% of all school districts receive Chapter 1 funds; three-quarters of all elementary schools and one-third of all secondary schools provide Chapter 1 services. Approximately 14% of all students from kindergarten through eighth grade are enrolled in Chapter 1.

Studies of the effects of compensatory education show

Academic gains

- Achievement and maintenance of statistically significant gains in reading and mathematics over a year
- Narrowing of the achievement gap between African-American and other elementary students
- Achievement gain drop when Chapter 1 assistance is not maintained
- Improvement in achievement as a result of substantial parent involvement
- Chapter 1 participants score 15-20% better than comparable non-participants on standardized reading and mathematics tests

Cost effectiveness

- It costs about $750 to provide a year of compensatory education to a student. In contrast, the mininum cost to repeat a grade in 1989-90 averaged $5,284 per student per year for 1989-90 and $5,638 per student per year for 1990-91.

- Studies suggest that completing an extra year of high school adds $715 to mean annual earnings of young people.

- Obtaining a high school diploma increases expected annual earnings by an additional $927.

- Raising the mean-tested basic skills of young adults by one grade equivalent can increase lifetime earnings by 3.6%, decrease out-of-wedlock births by 6.5%, decrease welfare dependency by 5.3% and decrease arrests by 6.2%, and increase tax revenues.

- The cost to business of retraining workers who lack basic reading, writing and computation skills is $2 billion per year.

- Each year's class of dropouts costs our nation $240 billion in lost earnings and foregone taxes over their lifetimes, not including the cost of welfare, health care and social services.

STUDIES

Compensatory Education Results in Significant Achievement Gains

Berlin, G. and Sum, A. Toward a More Perfect Union: Basic Skills, Poor Families, and Our Economic Future. Ford Foundation Project on Social Welfare and the American Future. New York, NY: The Ford Foundation. February, 1988.

> The authors maintain that teenage parenting, youth joblessness, dropping out of school and welfare dependency are closely intertwined and that basic skills deficiencies play a critical role in each of these social problems. "Nearly 60% of the total number of out-of-wedlock births that occurred among women 19-23 occurred among those who scored in the lowest 20% on a basic skills test."
>
> Research indicates that the higher a young person tests in reading, word knowledge and mathematics, the less likely he/she is to drop out of school before graduation. Studies show that "each one-point increase in test scores (is) associated with about a one percent increase in annual earnings....(C)ompleting an extra year of school at the secondary level would add $715 to the mean

annual earnings" of a sample group of young men and women.

The authors maintain that disadvantaged children "can learn and that their learning does lead to more educational attainment, graduations, and employment, and to lower rates of teenage childbearing and dependency. Special intervention programs facilitate that learning." Among the successful programs cited by the authors is Chapter 1. The authors note that the competency gains of Chapter 1 participants are particularly noteworthy because, "on average, (Chapter) 1 expenditures were only $600 per student....Another elementary school program, Follow-Through, also yielded significant academic gains for its participants."

Congressional Budget Office. Educational Achievement: Explanations and Implications of Recent Trends. Washington, DC: Government Printing Office. August 1987.

The CBO review of achievement indicates that about 14% of all students from kindergarten through eighth grade are enrolled in Chapter 1. The evaluation reports that "Title I/Chapter 1 could have contributed measurably to the relative gains of African-American and Hispanic students, but probably only in the early grades....In the higher grades, however, the effect of the program would have been far smaller -- perhaps even negligible -- because of the much smaller percentage of students participating in the program in those grades, the lesser impact of the program on older students, and the apparent lack of persistence of effects on younger students."

Overall, the summary review describes gains in test scores of 10% to 30% among Chapter 1 students in comparison to comparable non-participating students, and reports the program's greater impact in mathematics than in reading, as well as a larger effect in the lower grades than in the higher grades. The report also notes that gains were not "large enough to narrow substantially the gap between program participants and other students...[and] erode after participating students leave the program."

Mizell, M.H. Testimony at hearing, Changing Economics in the South: Preparing Our Youth. Select Committee on Children, Youth, and Families. U.S. House of Representatives. Washington, DC. April 24, 1987.

> South Carolina, under its education reform initiative, spent about $55 million in 1987 to provide compensatory and remedial education programs to approximately 245,000 students who did not meet the state's basic skill standards. The state also targeted resources to prepare 4-year-olds at risk of serious learning problems when they enter school. Of the more than 12,000 vocational students available for job placement, nearly 80% were either employed in areas related to their training or had continued in higher education. The state's kindergartners for the past two years have had the highest rate of average daily student attendance in the nation, and increasing numbers of students are scoring higher on standardized tests.

Children's Defense Fund (CDF). A Children's Defense Budget FY 1988. An Analysis of Our Nation's Investment in Children. Washington, DC. 1987.

> Summarizing results from studies of Chapter 1, CDF reports that "The Sustaining Effects Study, commissioned by the U.S. Department of Education, found that Chapter 1 students gained seven to twelve months in reading, and eleven to twelve months in math, for every year they participated in the program -- a significantly higher gain than they would have achieved without Chapter 1's help. Data from the NAEP (National Assessment on Educational Progress) also indicate that students in Chapter I-eligible schools scored higher in aggregate reading achievement scores than those in non-Chapter 1 schools. Moreover, by helping poor children keep up in school, Chapter 1 saves the cost of grade repetition, which is more than four times as high as that of Chapter 1 services."
>
> The report cites that $3,700 is the average per-student expenditure for a year, and therefore is the average per-student cost of repeating a grade. It also notes that research has shown that "most children who fail to master material one year gain little by repeating it a second year..[and] that holding children back means many of them will enter junior high school when they are much older than their peers -- making them significantly more likely to drop out."

Kennedy, M.M., et al. The Effectiveness of Chapter 1 Services. Second Interim Report from the National Assessment of Chapter 1. U.S.

Department of Education. Office of Education Research and Improvement. July 1986.

> Evaluation of Chapter 1 showed that national math and reading rankings of Chapter 1 students increase in every grade except 12th, in which the math ranking went up while reading stayed the same.

Carter, L. A study of the sustaining effects of compensatory and elementary education: the sustaining effects study. Santa Monica, CA: System Development Corporation. January 1983.

> U.S. Department of Education-supported study of elementary students in grades one to six found that students receiving Title I services gained more in reading in grades one, two and three and in math in all grades than similar students who did not receive Title I help.

Mullin, S., et al. "Is More Better? The Effectiveness of Spending on Compensatory Education." Phi Delta Kappan. January 1983.

> Authors conclude that evidence shows that Title I/Chapter 1 projects have a positive but small effect on the achievement of disadvantaged students; and that there is no significant association between achievement gains and project costs per pupil.

U.S. Department of Education. Office of Planning, Budget, and Evaluation. Planning and Evaluation Service. An Evaluation of ESEA Title I -- Programs Operations and Educational Effects. A Report to Congress. March 1982.

> Cited findings described above. Also noted, based on information collected over three years, that
>
> > In reading, students who left the Title I program because of high performance did not fall back noticeably after they ceased participation in Title I.
> >
> > The amount of regular instruction and tutor/independent work has positive effects on achievement.

National Assessment of Educational Progress. Has Title I improved education for disadvantaged students? Denver, CO: September 1981.

Title I emerged as the primary factor contributing to improved reading performance of youngsters in Title I schools. African-American elementary students closed gap with other elementary students by six percentage points; and African-American 13-year-olds narrowed gap with other 13-year-olds by 3.4 percentage points.

U.S. General Accounting Office. Greater Use of Exemplary Education Programs Could Improve Education for Disadvantaged Children. HRD-81-65. Report to the Congress. Washington, DC: U.S. GAO. September 1981.

When Title I assistance was resumed to 1,195 students after they had been out of the program for at least one school year, their achievement rates increased significantly. The rates of achievement gain had dropped when the Title I assistance was initially terminated. The percentage of students keeping up with or gaining on their peers jumped from 6% while out of the program to 78% when assistance resumed.

National Institute of Education. Compensatory Education Study. A Final Report from the National Institute of Education. Washington, DC: U.S. Department of Health, Education and Welfare. 1978.

Study mandated by Congress under the Education Amendments of 1974 to examine purposes and effectiveness of compensatory education programs. Study investigated six major areas: Fund allocation, service delivery, student development and program administration, parent involvement, and evaluation. Findings indicate that

> Compensatory instructional services clearly emphasize the basic skills of reading and mathematics; appear to be of high quality, as measured by class size, time for instruction, teacher qualifications and use of sound instructional techniques.

Compensatory education students make and maintain significant achievement gains over a year. First graders made average gains of 12 months or 12 percentile points in reading, and 11 months or 14 percentile points in mathematics. Third graders made average gains of seven months or nine percentile points in reading and 12 months or 17 percentile points in math.

Substantial Parent Involvement Improves Achievement

Haynes, N.M. and Comer, J.P. "The Effects of Parental Involvement on Student Performance." Unpublished paper. 1987.

> Students in grades three through five in seven New Haven schools employing a broad-based parent involvement program showed significantly greater improvement in behavior, attendance, and classroom reading grades than students in the control group.

Comer, J.P. School Power. New York: MacMillan, The Free Press. 1980.

> Intensive program, including substantial parent involvement, to change the organization and governance of two New Haven elementary schools located in low-income areas and beset with academic and behavioral problems resulted in significant, lasting gains in student achievement.

Gillum, R. "The Effects of Parent Involvement on Student Achievement in Three Michigan Performance Contracting Programs." Paper presented at AERA Annual Meeting. New York. 1977. Cited in Henderson, A. The Evidence Continues to Grow. Parent Involvement Improves Student Achievement. National Committee for Citizens in Education. 1987.

> School districts which designed and implemented most comprehensive parent involvement programs had students who showed the greatest improvements in reading skills.

Cost Effectiveness

Levin, H.M. "Cost-Benefit and Cost-Effectiveness Analyses of Interventions for Children in Poverty." Huston, A.C. (ed.) Children in Poverty. New York, NY: Cambridge University Press. (In Press)

Study of cost of cohort of 25-34 year old males in 1970: If all had graduated from high school, an additional $238 billion in lifetime earnings would have been produced compared to an estimated $40 billion in costs to educate them. This increase in earnings would have generated approximately $71 billion in government revenues, about $1.75 for each dollar invested in increasing the number of high school graduates. Study also estimated that inadequate education contributes approximately $6 billion per year to the cost of welfare and crime.

Study of the estimated cost and effectiveness of four compensatory educational interventions for educationally disadvantaged students showed a range in math from .3 month of achievement gain associated with a longer school day to 9.7 months associated with peer tutoring and a range in reading from .3 month associated with reduced class size to 4.8 months associated with peer tutoring. Annual costs to obtain month of achievement ranged from $44 for peer tutoring in reading to $203 for a longer school day for improvements in mathematics.

Woodside, W., et al. Testimony before the U.S. House of Representatives Subcommittee on Elementary, Secondary, and Vocational Education and the U.S. Senate Subcommittee on Education, Arts and Humanities. 100th Cong., 1st Session, March 16, 1987.

Corporate chief executive officers from five major corporations testified in support of Chapter 1, referring to the program as an investment. They also called for serving more eligible children. They estimate that the cost to private industry of having to retrain workers who lack basic skills can be $2 billion per year and result in an additional $26 billion in social program costs.

Children's Defense Fund. 1987. op. cit.

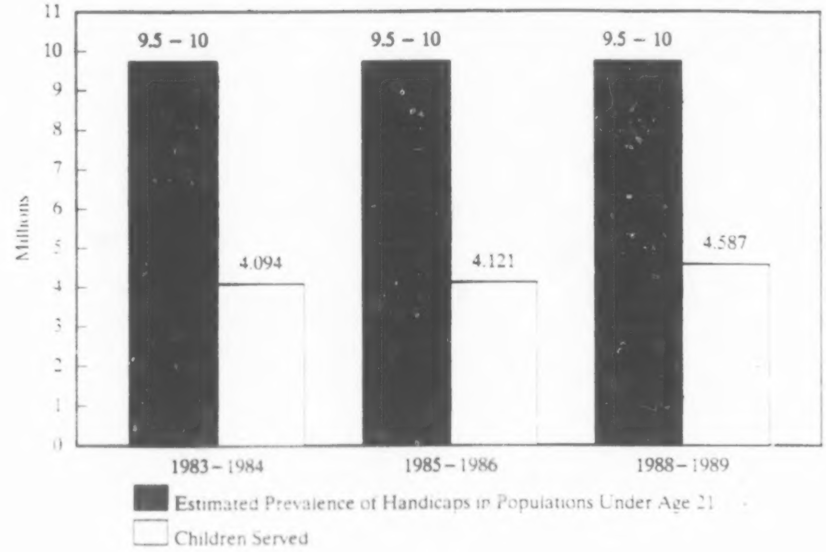
National Center for Educational Statistics. "1983-84 Digest of Educational Statistics." Washington, DC: U.S. Department of Education. December 1983. Cited in Barriers to Excellence: Our Children at Risk. National Coalition of Advocates for Students. January 1985.

> It costs only $500 to provide a year of compensatory education to a student before he or she gets into academic trouble. It costs more than $3,000 when one such student repeats one grade once.

National Coalition of Advocates for Students. 1985. op. cit.

> "When compensatory education prevents one student's repeating a grade, we can provide compensatory education to five other students at no cost. Since students who repeat grades are those most likely to drop out or get pregnant too early even after remaining in school for several extra years, the real social benefit from targeted compensatory education is much greater. Early attention clearly has measurable effects in later years."

Education of Children with Disabilities
Participation* (Children Ages 3-21)



* State Grant Program

Sources: Estimated Prevalence of Handicaps: Kakalik, J., et al. 1973.

Children Served: U.S. Department of Education. Office of Special Education and Rehabilitative Service.

P.L. 94-142, EDUCATION OF CHILDREN WITH DISABILITIES

The Individuals with Disabilities Education Act authorizes programs to support and improve the education of children with disabilities. The largest and best known of these is the State Grant Program, authorized by P.L. 94-142, the Education for All Handicapped Children Act. Its purpose is to assure that every handicapped child ages 3-21 years, residing in a state participating in the program, receives a free, appropriate education in the least restrictive environment. P.L. 99-457 expanded services to children with disabilities by supporting educational services for preschool children ages 3 to 5 and state programs for disabled and developmentally at-risk infants and toddlers from birth to age 2.

P.L. 94-142 mandated and first supported evaluation studies in 1976. Until recently, evaluations focused on the progress and effects of implementing the Act. P.L. 98-199, Education of the Handicapped Act Amendments enacted in the 98th Congress, moved the emphasis in evaluation beyond implementation toward effects on students and cost effectiveness.

There is agreement that while much room for improvement remains, there has been substantial progress in special education programs and services due to P.L. 94-142. Reports point to

Increases in the number of students served and in available services

Successful implementation of P.L. 94-142

Benefits to students who have received special education

- Colorado Department of Education follow-up survey suggests that high school graduates who participated in special education programs in Colorado have made positive adjustments in their communities. Nearly 70% were working at least part-time and contributing significantly to their own support.

- Children with disabilities who had received special education services in Connecticut reported considerable success and satisfactory adjustment in educational, employment and personal areas of their lives since leaving school.

- A study of secondary programs for children with mild disabilties in New York City and upstate New York found that four out of five students took the state competency tests and achieved a high rate of success. A majority of the city students passed in each of the three areas tested. Three-quarters of the upstate students passed in each subject area.

Effectiveness of special education services in moving children with disabilities into regular classes

- Two-thirds of the students who participated in a Kentucky kindergarten program for 5-year-olds with disabilities have been placed in regular classrooms.

- A Delaware program that integrated special education students with regular education students found both that the students with disabilities made significant academic gains and that the nondisabled students outperformed their peers in ordinary classes.

Importance and cost effectiveness of early intervention services for infants with disabilities and preschoolers in promoting healthy development and decreasing the need for special education programs

- Cost of lifetime institutionalization estimated at $655,804 compared with $76,000 in instructional costs for special and regular, noninstitutionalized instruction.

- If intervention for infants with disabilities is delayed until age 6, education costs to age 18 are estimated at $53,350. Intervention at birth is estimated to result in lower education costs of $37,272, a savings of $16,078.

- For every $1 invested in high quality preschool programming, there is a $3 reduction in public special education costs.

- School districts in Colorado have saved $1,560 per pupil in special education costs because of the INREAL early intervention program.

STUDIES

Implementation, Services and Effects

U.S. Department of Education. Office of Special Education and

Rehabilitation Services. Twelfth Annual report to Congress on the Implementation of The Education of the Handicapped Act. Washington, DC: U.S. Department of Education. 1990.

> The number of children with disabilities served during the 1988-89 school year increased 2.1% over the number served in 1987-88 to 4,587,370. The number of 3- to 5-year-olds served increased 21% from 265,814 in 1985-86 to 321,360 in 1988-89. An additional 41,083 preschool children were served under Chapter 1 of ESEA (Elementary and Secondary Education Act). Learning disabled children account for 48% of children served.

U.S. Department of Education. Office of Special Education and Rehabilitation Services. Eleventh Annual Report to Congress on the Implementation of The Education of the Handicapped Act. Washington, DC: U.S. Department of Education. 1989.

> The number of children with disabilities served in the 1987-88 school year increased 1.6% over the number served in 1986-87 to 4,494,280. Additional cost of special education averages $2,463 in resource programs, $4,133 in self-contained programs, $26,727 in residential programs.
>
> A Montgomery County, Maryland, study of children 5 years old and younger who were identified for placement in special education found that significant benefits accrued to children receiving preschool special education services. The preschool services appeared to produce the greatest benefits to children at younger ages, particularly among children with multiple disabilities.

Bruininks, R.H., et al. Assessing Outcomes, Costs and Benefits of Special Education Programs. Minneapolis, MN: University of Minnesota Affiliated Program on Developmental Disabilities. January 1988.

> Cost-benefit study of mildly retarded former special education students indicates that their projected lifetime earnings exceed the costs of their special education. This is particularly true if institutionalization is avoided.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Tenth Annual Report to Congress on the

Implementation of The Education of the Handicapped Act. Washington, DC: U.S. Department of Education. 1988

> Dropout rates for students with disabilities are approximately ten percent higher than for nondisabled students. A Vermont study of transitioning special education students reported the highest earnings for disabled high school graduates: 28% received more than $5.00 per hour while only 11% of dropouts received this rate of pay. For disabled students over the age of 16 leaving school, approximately 16% of the services needed are vocational/training; 14% are vocational placement; 14% are counseling and guidance services and 13% are evaluation of vocational rehabilitation services.
>
> The Arkansas Department of Education serves hearing-impaired and deaf children from birth to age 5 through a home intervention program that provides hearing evaluations, speech and language therapy, audiology and psychological services, as well as parent training. The program enables students, who in the past would have been institutionalized at school age, to be mainstreamed into regular school settings at age 5.

Shonkoff, J.P. "Early Intervention for Disabled Infants and Their Families: A Quantitative Analysis." Pediatrics. Vol. 80. No. 5. November 5, 1987.

> Review of 31 studies indicate that early intervention is effective in promoting developmental progress in infants and toddlers with biologically-based disabilities. The most effective programs included an extensive parent involvement component, including volunteering in the classroom, planning and evaluating activities, and implementing carryover activities at home.
>
> Studies indicated that mildly disabled infants enrolled in programs before the age of 6 months experience significantly better outcomes. For more severely disabled children, improvements appear at a constant rate regardless of their age of entry into a program.

Rule, Sarah, et al. "The Social Integration Program: An Analysis of the Effects of Mainstreaming Handicapped Children into Day Care Center." Education and Treatment of Children, Vol. 10, May 1987.

The authors evaluated the Social Integration Program (SIP), a model early intervention program that mainstreams disabled children in child care centers. There are four components to the program: (1) special education services, including screening and assessment, and IEP (individual education plan) development; (2) a basic developmental skills program; (3) social skills training and (4) home support. The SIP children were compared to a group of children with disabilities served by Head Start and to nondisabled children of the same age. Tests indicate that the disabled SIP children made progress comparable to that of disabled children in other programs. The SIP program cost $14.49 per child per full day compared to $18-$25 spent per child for a half day in self-contained special education preschool programs in Utah. Additional cost savings resulted from the SIP children being mainstreamed once they entered public school as opposed to being placed in more costly self-contained special education classrooms.

Singer, J.D. and Butler, J.A. "The Education for All Handicapped Children Act: Schools as Agents of Social Reform." Harvard Educational Review. Vol. 57. 1987.

The authors report that data from five major metropolitan school districts demonstrate that the Education of the Handicapped Act (EHA) has been an effective instrument for influencing local special education programs. The law's implementation produced a major shift in assumptions and attitudes about the rights of disabled students.

The authors contend that those who have benefited the most from EHA programs are the most and the least disabled, whose numbers have increased since the law went into effect. Contrary to stereotypical views, distribution of resources is nearly equal across disability. The education of a handful of severely impaired children does not drain resources from less severely impaired children. Especially in large school districts, the higher costs associated with a few severely disabled children tend to cancel the costs associated with many less disabled children. They caution, however, that children, regardless of the severity of their disability, may be at risk of failure because of family background or other factors associated with, but not resulting from, their disability.

Variations in per pupil expenditures mean that more affluent school districts offer more services, including better trained teachers, staff and additional related services. School districts with lower per pupil expenditures tended to have lower rates of health insurance coverage and use of physicians among students.

Programs under the EHA have reduced the number of children in institutions and created better preconditions for disabled children to acquire skills leading to self sufficiency.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Ninth Annual Report to Congress on the Implementation of The Education of the Handicapped Act. Washington, DC: U.S. Department of Education. 1987.

The number of children with disabling conditions served in the 1985-86 school year increased slightly over the previous year to a total of 4,370,244, most served under P.L. 94-142. 4,121,104 children ages 3-21 were served under the State Grant Program, up approximately 27,000 from 4,098,104 in 1983-84.

An evaluation of developmental and pre-academic education services for disabled children 3 to 5 years of age in Louisiana found accelerated gains in a wide range of measures. In a seven-to-eight month period of instruction, average gains in fine motor skills ranged from 10.4 to 10.9 months in cognitive skills, from 10.1 to 11.6 months; in language skills, from 9.6 to 11.8 months; and in gross motor skills, 7.7 to 9.6 months.

A study of children participating in a special education program in Delaware that allows disabled children to be educated in the regular classroom 100% of the time found that the disabled students in grades K-6 experienced significant gains in reading, spelling, and math. Non-disabled K-6 students participating in the program also achieved consistently higher scores in statewide testing programs than their peers enrolled in ordinary classes.

A program in North Carolina that provides support for regular education teachers who work with special needs children has resulted in better use of diagnostic and curricular information by teachers; a decrease in misclassification; and earlier and more appropriate referrals.

Two-thirds of the students who participated in Kentucky's Individualized Kindergarten program, which serves disabled 5-year-olds, have been placed in regular classrooms. Of these, 60% did not require special assistance, while 40% received resource room assistance. Students in the program showed statistically significant improvement in the areas of fine and gross motor skills, cognition, and language when tested after completion of the program.

A Massachusetts Department of Education evaluation of the impact and effectiveness of special education programming on a statewide basis made the following positive findings:

- Special education programs are considered effective in developing basic skills in language arts, mathematics, and the encouragement of an understanding of our democratic society.
- Special education programs develop attitudes and behaviors which lead to an effective use of the environment and the development of creative expression.
- The programs are effective in providing beneficial physical education, enhancing student self-concepts, and cultivating positive values and attitudes among students.
- The programs facilitate sound educational planning and encourage a working partnership between the parents and the school.

The Massachusetts evaluation also found, however, that the special education programs were less than effective in developing the students' desire to learn.

A New York State Education Department evaluation of secondary programming for mildly disabled students found that these students can succeed in school and earn a high school diploma when given access to regular education and equivalent special education courses. Ninety-eight percent of upstate students and 96% of New York City students who participated in regular education courses, passed at least one course. Over 90% of the upstate and New York City mildly disabled students were successful in equivalent special education programs on the first try. Four out of five mildly disabled students took the state competency tests and they achieved a high rate of success. On their first attempts, 92% of upstate students passed reading, 84% passed writing and 77% passed mathematics. For city students, 77% passed reading, 85% passed writing, and 54% passed mathematics.

In Wisconsin, 100% of the 1985 and 1986 graduates of a transition to employment program for moderately to severely disabled adolescents found employment in non-sheltered work settings.

Castro, G. and Mastropieri, M.A. "The Efficacy of Early Intervention Programs: A Meta-Analysis." Exceptional Children. Vol. 52. No. 5. February 1986.

Evaluation of early intervention programs for children with disabilities indicate moderately large immediate benefits for handicapped populations. These results are evident over a variety of outcome variables including IQ, motor, language, and academic achievement. Longer, more intense programs are associated with greater efficacy.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Seventh Annual Report to Congress on the Implementation of the Education of the Handicapped Act. Washington, DC: U.S. Department of Education. 1985.

Reviews of the effectiveness of preschool education for children with disabilities have demonstrated educational and economic benefits. Further, the earlier the intervention, the greater the ultimate dollar savings and the higher the level of educational achievement.

Study of high school graduates who participated in special education programs in Colorado showed that they made positive adjustments in their communities. Nearly 70% were working at least part-time. "There was little evidence of financial dependence upon such social programs as welfare. However, the study also found that these former students remain at only marginal levels in the community's social, economic, and employment activities."

Students with disabilities in one class in Connecticut, who received special education services, reported considerable success and satisfactory adjustment in education, employment and personal areas of their lives since leaving school.

Cost Effectiveness

Bruininks, R.H., et al. Assessing Outcomes, Costs and Benefits of Special Education Programs. Minneapolis, MN: Minnesota University

Affiliated Program on Developmental Disabilities, University of Minnesota. 1988.

> The authors designed a paradigm for a cost-benefit analysis of mainstreaming mildly retarded students versus institutionalization. The authors estimated the cost of lifetime institutionalization at $655,804, compared with $76,000 in instruction costs for special and regular education. In addition, in the sample population studied by the authors, more than one-half of the mildly retarded adults, who had been mainstreamed as students were working. The value of their income would have to be added as an additional cost to society in calculating the cost of institutionalization versus mainstreaming.

Smith, B.J. and Strain, P.S. "Does Early Intervention Help?" ERIC Digest #455. 1988.

> The authors summarize research on the cost-effectiveness of early intervention programs for children with disabilities. Among the studies summarized are the following:
>
> - Research by M.E. Wood that "calculated the total cumulative costs to age 18 of special education services to a child beginning intervention at: (a) birth; (b) age 2; (c) age 6; and (d) at age 6 with no eventual movement to regular education." Wood found that the total costs of special education services were less if begun at birth: $37,273 from birth and between $46,816 and $53,340 if begun at age 6.
> - Research by Snider, Sullivan, and Manning in Tennessee found that for $1 spent on early treatment for severe behavior disordered children, $7 in savings were realized within 36 months.

Rule, S., et al. 1987. op. cit.

U.S. Department of Education. 1987. op. cit.

U.S. Department of Education. 1985. op. cit.

Garland, C., et al (eds.). "Early intervention for children with special needs and their families: Findings and recommendations." Westar Series Paper No. 11. Seattle, WA: The University of Washington, 1981. (ERIC Document Reproduction Service No. ED207 278). Cited in U.S. Department of Education. 1985. op. cit.

> "If intervention began at birth, education costs to age 18 were projected to be $37,272. If intervention was delayed until age six, the cost was projected to be $53,350."

Berrueta-Clement, J., et al. Changed Lives: The Effects of the Perry Preschool Program on Youths Through Age 19. Ypsilanti, MI: The High/Scope Press. 1984. Also cited in U.S. Department of Education. 1985. op. cit.

> Cost/benefit analysis concluded that two years of high quality preschool for children who tested as borderline mentally retarded returns three and one-half times the initial investment.

McNulty, B.A., et al. "Effectiveness of Early Special Education for Handicapped Children." Report Commissioned by the Colorado General Assembly. 1983.

> Colorado Research Design Study evaluated the program and cost effectiveness of INREAL early intervention and found that, even after subtracting the costs of the preschool special education program, the school districts saved $1,500 per disabled pupil and $1,050 per at-risk pupil because of the intervention.

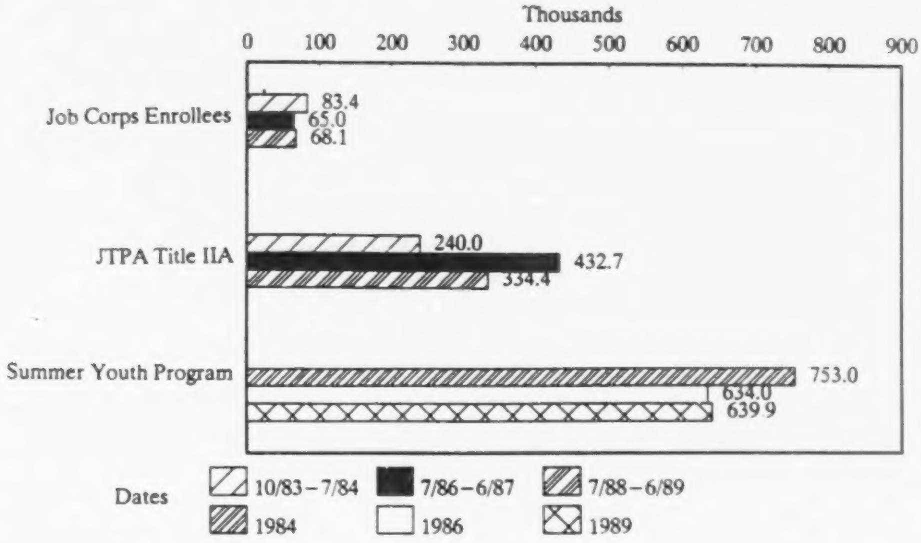
Weiss, R.S. "INREAL intervention for language handicapped and bilingual children." Journal of the Division for Early Childhood. 1981.

> Analysis of the cost effectiveness of the INREAL intervention in Colorado showed cost savings of nearly $1,300 per child over a three-year period.

Schweinhart, L.J., et al. Young Children Grow Up: The Effects of the Perry Preschool Program on Youths Through Age 15. Ypsilanti, MI: High/Scope Educational Research Foundation. 1980.

Analysis of cost effectiveness of early intervention showed that for every $1 invested in high quality preschool programming, there is a $3 reduction in public special education costs.

Youth Employment and Training Participation (Ages 16-21)



Source: U.S. Department of Labor. Employment and Training Administration.

Note: In 1989, the annualized unemployment rate among youth ages 16-21 was 13.2%. Among white, African-American, and Hispanic youth, the 1989 annualized unemployment rates were 13.7%, 29.4%, and 20.9% respectively. (U.S. Department of Labor. Bureau of Labor Statistics.)

YOUTH EMPLOYMENT AND TRAINING

The Job Training Partnership Act (JTPA), which funds a variety of locally-designed job training programs for young people, went into effect in October 1983. It includes permanent authorization for the three major federal job training programs serving youth. These are (1) Title IIA, which provides block grants to states to fund training and related services for economically disadvantaged youth and adults; (2) Title IIB, which provides funds for summer job programs for youth and (3) Title IVB, the Job Corps. In addition to these programs, beginning with the Youth Employment Demonstration Projects Act of 1977 (YEDPA), the U.S. Department of Labor has funded a number of demonstration projects designed to test different approaches to providing job training to youth.

The JOBS component of the Family Support Act of 1988 (FSA) requires participation in job training or educational activities for AFDC (Aid to Families with Dependent Children) recipients with children over the age of three (or younger at state option and/or if the recipients volunteer). With implementation beginning in late 1989, it is too early to assess the average age of the participants under the new law.

Evaluations of job training programs show that a combination of remedial education, job training and well-structured work experience can lead to improvements in employability and wages. Some programs have proved successful in helping students to remain in school and have reduced summer learning loss.

Evaluations demonstrate

Employability and wage gains

- Over $650 more per year in average earnings, and over three weeks per year more of employment for Job Corps participants in the first four years after program participation

- Increased employment rate and earnings of program participants served in YIEPP (Youth Incentive Entitlement Pilot Projects), which guaranteed full-time summer and part-time year-round jobs for youths who were in or returned to school

- Employment and hourly earnings gains for youth who had completed CETA (Comprehensive Employment and Training Act) youth and adult-oriented programs

Prevention of school enrollment declines

Other benefits

- Higher college attendance, less dependence on welfare and significant shift from more to less serious crime for Job Corps participants
- Large reductions of usual summer learning loss in reading and mathematics

Cost effectiveness

- The Job Corps investment is estimated to yield an economic return to society of 46%, or $2,300 per enrollee, by increasing employment and earnings and decreasing crime and transfer payments. The program is estimated to pay back the investment in about three years.
- One year's cohort of high school dropouts and deficient high school graduates may forego an estimated $150 billion to $300 billion in earnings over their lifetimes, or about $135,000 to $300,000 per individual. Another $10 billion may be incurred in increased social costs such as crime and welfare.
- A study of youth conservation corps conservatively calculated the cost-benefit ratio at .96, not including reductions in criminal activity or welfare payments.

STUDIES

Employability and Wage Gains

U. S. Government Accounting Office. Job Training Partnership Act. Youth Participant Characteristics, Services, and Outcomes. HRD-90-46BR. Washington, DC: U.S. GAO. January 1990.

This report identifies the factors that make it more likely for JTPA participants to experience difficulty in the labor market:

Being a school dropout; member of a minority group; on welfare; a single parent; and without recent work experience.

GAO surveyed 5,300 youth who were JTPA participants. Two-thirds were out of school. Seventy-nine percent of the out-of-school youth were placed in jobs or had other positive outcomes. Those youth who received occupational training were more likely to find jobs with higher starting wages than those who received nonoccupational training or job search assistance only. While GAO found little evidence of "creaming," it also criticized JTPA for not targeting its resources to those out-of-school youth who are less job ready and therefore presumably have the greatest need.

U.S. Department of Labor. Employment and Training Administration. Job Corps in Brief. Program Year 1988. Washington, D.C.: U.S. Department of Labor. 1989.

Total positive outcomes -- employment or further education -- for program year 1988 (July 1988 - June 1989) totalled 73.9%.

70001. Solutions Addressing the Plight of Challenged Youth. Philadelphia, PA: 70001. September 1988.

70001 designed and implemented a model employment training program targeted to youth ages 16-21 who were high school dropouts, unemployed, and not involved with any other training or service program. The project provided services to 588 youth in Birmingham, Alabama, and Dallas, Texas.

Four hundred eighty four youth were positively terminated and the project helped 227 participants to find employment. This compares favorably with the U.S. Department of Labor National Standards for FY 1988-99, which require a 45% success rate in job placement and 75% positive termination rate. The project cost per positive termination was $2,128 compared with the DOL youth performance standard of $4,900. The model was particularly successful in its outreach to minority male youth. Activities included an individualized employability plan, remedial education, employment services, motivational activities and post-termination follow-up.

William T. Grant Foundation Commission on Work, Family and Citizenship. The Forgotten Half: Non-College Youth in America. Washington, DC: William T. Grant Foundation Commission on Work, Family and Citizenship. January 1988.

> The Commission calls for breaking down the barriers between education and the world of work. Evaluations of high school vocational education programs generally report that these programs do not adequately prepare young people for work because schools are poor settings for learning job skills. Cooperative education as a school-to-work transition program has been used extensively in teaching wholesale and retail commerce and should be expanded to other areas. Internship and apprenticeship programs are other underutilized, effective transition programs.
>
> The report also cites the success of Jobs for America's Graduates (JAG), which services approximately 11,000 high school students. The program includes instruction in 33 employment abilities, job development and placement assistance, a Student Career Association, and followup support for nine months after high school graduation. According to program evaluations, JAG graduates were 60% more likely to be employed full-time than non-JAG partcipants. Twenty months after graduation, the 1984 JAG graduates averaged eight more weeks of employment than nonparticipants and earned an average of $2,000 more.
>
> Existing second chance opportunities for youth who are out of school and out of work, including the Job Corps, state and local youth corps, non-residential pre-employment training, the Job Training Partnership Act and Armed Forces programs, can be used to upgrade academic and work skills of recruits.

Branch, A., et al. Youth Conservation and Service Corps. Findings from a National Assessment. Philadelphia, PA: Public/Private Ventures. December 1987.

> Youth conservation and service corps are a special class of social programs that promote the development of young people while they do useful work of real value to their communities. Public/Private Ventures (PPV) studied nine programs to determine their effectiveness. The evaluation found that the California Conservation Corps produces large and statistically significant increases in postprogram incomes of economically disadvantaged participants. The overall evaluation found that youth corps are

successful in meeting their productivity and cost-benefit goals, that they produce positive income effects for poor youth, and that the addition of human service work also increased their potential for meeting important community needs. In addition, the study found that the conservation corps produced work of equal or greater value than the cost of producing it. The programs were less successful in recruiting a diverse mix of participants and in establishing formal programs to improve basic skills.

McMullan, B.J. and Snyder, P. Allies in Education. Schools and Businesses Working Together for At-Risk Youth. Philadelphia, PA: Public/Private Ventures. Fall 1987.

Public/Private Ventures assessed nine school/business partnerships designed to help students make the transition from school to work. A major benefit of the programs was summer job opportunities. The Boston Compact placed more than 2,500 students in summer jobs during 1986 and helped others find part-time jobs during the school year. Students learn basic employability skills and receive on-the-job training. The Philadelphia Academies, with an emphasis on employability and academic performance, has produced attendance rates of over 90%.

Sipe, C.L., et al. Summer Training and Education Program: Report on the 1986 Experience. Philadelphia, PA: Public/Private Ventures. April 1987.

The Summer Training and Education Program (STEP) aims to increase basic skills and lower dropout and teen pregnancy rates by providing poor and under-performing youth (14-15 years old at entry) with remediation, life skills and work experience during two consecutive and intensive summer programs, with ongoing support and personal contact during the intervening school year. Program initiated at five model sites in the summer of 1985.

For the second cohort (summer 1986), the majority of the usual summer learning loss in reading was stemmed: At the end of the summer, STEP youth scored higher than control youth. In math, STEP youth made gains, whereas the control group lost ground. STEP youths scored eight-tenths of a grade equivalent higher than controls. For the first cohort (summer 1985), learning losses were cut in half, so that STEP youth were a quarter of a grade equivalent ahead of the controls. During the following school year, STEP youth were 22% less likely to fail than were controls (18.7% failure rate for participants versus 22% for controls).

Committee on Government Operations. U.S. House of Representatives. Job Corps Program: Its Benefits Outweigh the Costs. House Report 99-215. Washington, DC. July 1985.

Report discusses reviews of the program, (including studies by Mathematica Policy Research, Inc., the Department of Labor, and the National Research Council's Committee on Youth Employment Programs). Report concludes that Job Corps is a "highly successful anti-poverty program,"...serving a more disadvantaged and disenfranchised youth population than other job training programs,...with over 75% of all enrollees moving on...either to a job or to school."

"Job Corps is not only effective in serving the needs and providing quality job training for the Corps members themselves, but also provides society as a whole with a net social profit of 46 cents of every tax dollar invested in the program."

Westat, Inc. Continuous Longitudinal Manpower Survey. CLMS Follow-up Report No. 13. Postprogram Experiences, with Pre/Post Comparisons, for Terminees Who Entered CETA During FY 1980. Prepared for Office of Strategic Planning and Policy Development, Division of Performance Management and Evaluation, Employment and Training Administration, U.S. Department of Labor. December 1984.

Department of Labor-supported study of postprogram labor market experiences of individuals who were newly enrolled in CETA programs during FY 1980 showed that youth enrollees in all program activities made "improvements in their employment and earnings. Annualized earnings between the first quarter before entry and the first quarter after termination more than doubled. By the sixth quarter after termination, earnings more than tripled, compared to the immediate pre-program quarter."

Youth who participated in YETP (Title IV-A, CETA) increased their earnings by an annualized $1,810 -- 17% -- from the fourth quarter before program entry to the sixth quarter after termination. Participants in on-the-job training (OJT) doubled their earnings to $4,160 in the same period.

Farkas, G., et al. Post-Program Impacts of the Youth Incentive Entitlement Pilot Projects (YIEPP). New York. Manpower Demonstration Research Corporation. June 1984.

> YIEPP guaranteed full-time summer and part-time year-round jobs for youths when they were 16-19 years of age, upon their promise to remain in school or return to school if they had dropped out. The program resulted in increases in employment for the target population, with especially large employment effects for African-America youths -- those at greatest risk for unemployment and other employment problems. "Preliminary analysis showed that, overall, the program increased the employment rate of 15-16 year old cohort by nearly 19%, for an 84.2% improvement over the comparison group. During the school year, the employment rate of the groups increased by 115% over what it would have been in the absence of the program."
>
> Final analysis indicated that the program helped youth remain in school, "avoiding the negative effects often associated with youth employment programs without an enrollment requirement." Program effects for African-American youths include significant earning gains during the program and throughout the follow-up period. Post-program effects were substantially larger for high school graduates than nongraduates.
>
> It was estimated that the increase in earnings, if persistent, would be $746.52 per program participant per post-program year.

Mallar, C., et al. Project Report: Evaluation of the Economic Impact of the Job Corps Program. Prepared for Office of Policy and Research, Employment and Training Administration, U.S. Department of Labor. Mathematica Policy Research, Inc. September 1982.

> In the first four years out of the Job Corps, participants on average earned over $650 (15%) more per year and were employed over three weeks more a year than nonparticipants; had higher college attendance; had reduction in serious health problems of an average of over one week per year; received less financial welfare assistance, amounting to an average of over two weeks per year, had a reduction in the receipt of unemployment insurance of nearly one week per year; and show a reduction in serious crime. Results appear stable throughout the four years of post-program observation.

The program's economic benefits to society are estimated to be about $7,400 per participants (in 1977 dollars) compared to costs of $5,100, thus yielding a return to society of 46%. It is estimated that the social investment is paid back in about three years.

U.S. General Accounting Office. Labor Market Problems of Teenagers Result Largely From Doing Poorly in School. PAD-82-06. Washington, DC. March 29, 1982.

GAO study examined teenage unemployment problems. GAO "reviewed several studies made by the Department of Labor and other researchers and found that the need estimates varied widely, from 379,000 to 3.7 million youths." GAO calculated that, as of 1977, those in need of employment and training services were "962,000 economically disadvantaged youths with a high school degree or lower attainment." The report concluded that school performance and attainment are important factors in youth employment.

Congressional Budget Office. Congress of the United States. Improving Youth Employment Prospects: Issues and Options. February 1982.

Summarizing analyses of employment and training programs for disadvantaged youths, the CBO notes that

> Success in the work place is closely related to basic writing, communication, and computational skills.
>
> Work experience alone does not appear to improve the employability of disadvantaged youths, even when the work experience is well supervised and highly supportive.
>
> Substantial gains in employability are possible for disadvantaged youths when they are offered a combination of services, including remedial education, well-structured work experience, and training. Gains in employability appear to be related only to the time spent in education and training activities, although work experience can be useful as a motivation to continue [e.g., as done in Youth Incentive Pilot Project (YIEPP)]." (The estimated cost per service year of providing a part-time job during the school year and a full-time job during the summer months was

$4,900 for 1982; YETP-CETA Title IV-A service year costs were $4,700.)

Study also comments on the effectiveness of Job Corps, stating that, while it is the most expensive of the youth employment programs (costing about $14,000 per full-time, full-year training slot and proportionately less per participant), its benefits have been shown to exceed its costs.

School Retention

McMullan, B., et al. Allies in Education. A Profile of: The Boston Compact. Boston, Massachusetts. Philadelphia, PA: Public/Private Ventures.. September 1987.

In 1982-83, the Boston school system entered into separate agreements with the Boston business community and with local colleges and universities. The business community agreed to provide priority hiring for Boston public high school graduates. The colleges and universities agreed to provide greater access to graduates and in a 1984 agreement, building and trade unions agreed to recruit graduates into apprenticeship programs. In return, the Boston School Department agreed to: (1) improve daily attendance by 5% each year; (2) reduce the high school dropout rate by 5% each year; (3) improve the academic performance of high school graduates; (4) improve college placement rates by 5% each year, and (5) improve job placement rates by 5% each year.

Between 1982-83 and 1984-85, academic achievement as measured by standardized tests, rose, although they remained below national averages: Ninth grade math scores went from the 42nd percentile to the 50th percentile. Ninth and tenth grade reading scores rose by ten percentiles. Average daily attendance rates also rose.

Manpower Demonstration Research Corporation. 1984. op. cit.

Other Benefits

Watson, B. and Jaffe, N. The Practitioner's View. New Challenges in Serving High-Risk Youth. Philadelphia, PA: Public/Private Ventures. 1990.

The authors assert that the limited success of youth employment and training programs over the past 30 years is due to (1) a lack of resources; (2) the inability or unwillingness of youth employment programs to meet the multiple needs of at-risk youth, including basic skills and other social welfare needs, and (3) the difficulty in attracting at-risk youth to "second-chance" programs.

Youth entering employment programs during the 1980s were more "at-risk" than their earlier counterparts: There are more dropouts, more single parents, more youth with severe basic skills, literacy and English language deficiencies, lower incomes and greater housing, food and clothing needs. As a result, they need support services, basic education skills and employment-readiness skills. Some of the more successful programs have added additional support services into their programs, including child care, health care, housing and nutrition education. Surveys indicate that "aggressive, street-level recruiting" is necessary to attract high-risk youth.

Auspos, P., et al. Implementing Jobstart. A Demonstration for School Dropouts in the JTPA System. New York, NY: Manpower Demonstration Research Corporation. June 1989.

Jobstart began in 1985 as a demonstration project to test a program of basic education, occupational skills, support services, and job placement assistance for young, economically disadvantaged dropouts reading below the eighth grade level. It was designed and implemented by the Manpower Demonstration Research Corporation and funded by corporate sponsors, private foundations and JTPA funds. It is being implemented at 13 diverse sites throughout the country. The program includes instruction in basic academic skills, occupational skills training, training-related support services and job development and placement assistance. In concept, it is similar to the Job Corps, but is nonresidential.

Jobstart is designed to test the effectiveness of different approaches to providing services, including whether participants attend concurrent classes in basic education and occupational skills or whether they attend them sequentially. A second major variable is whether Jobstart provides occupational training or finds the services elsewhere and refers the participants to them.

Preliminary findings indicate that both students and teachers liked the basic education activities, and there is evidence of educational progress. The average length of stay in the program was 6.7 months, longer than the average 3.4 months for dropouts participating in traditional JTPA Title IIA programs. After one year, 26.5% of participants had obtained a General Educational Development (GED) certificate as compared with only 6.9% of the control group. The project reflects the need for serious recruitment efforts to attract young people to the program and extensive support services to keep them there. Basic education skills must be taught through a variety of techniques, including, but not limited to, individualized computer-assisted teaching.

Sipe, C., et al. Summer Training and Education Program (STEP). Report on the 1987 Experience. Philadelphia, PA: Public/Private Ventures. 1988.

STEP aims to increase basic skills and lower dropout and teen pregnancy rates by providing poor and under-performing youth (age 14-15 at entry) with remediation, life skills and work experience during two consecutive and intensive summer programs, with ongoing support and personal contact during the intervening school year. The program was initiated at five model sites in the summer of 1985.

The third cohort of participants was the first group to achieve significant gains in both reading (0.3 of a grade) and math (0.2 of a grade) in their first summer of the program. This group scored 0.5 of a grade higher in reading and 0.6 of a grade higher in math than did the control group.

During their second summer, the second cohort experienced no change in their math and reading levels, in contrast to the control group, which experienced substantial losses. The net impact of STEP participation at two of the sites was equivalent to 0.7 of a grade higher in reading and 0.8 of a grade higher in math.

Postprogram experiences of the first cohort (summer 1985) show that the STEP youth had higher math scores than the control group and were more likely to be promoted.

Program costs averaged $1,525 per enrollee.

70001. 1988. op. cit.

McMullan, B.J. and Snyder, P. 1987. op. cit.

Sipe, C.L., et al. 1987. op. cit.

Mallar, C., et al. 1982. op. cit.

Cost Effectiveness

U. S. Government Accounting Office. Training Strategies. Preparing Noncollege Youth for Employment in the U. S. and Foreign Countries. HRD-90-88. Washington, DC. May 1990.

> This study reported that the United States invests less than one-half as much in education and training for noncollege-bound youth as it does in college education. The inadequate preparation of young noncollege workers has both individual and social costs. Just one year's cohort of high school dropouts and deficient high school graduates may forgo an estimated $150 to $300 billion in lost earnings over a lifetime, or $135,000 to $300,000 per individual. At least some of these losses could be recouped through increased investment in education and training for noncollege-bound youth.

Berlin, G. and Sum, A. Toward a More Perfect Union: Basic Skills, Poor Families, and Our Economic Future. Ford Foundation Project on Social Welfare and the American Future. New York, NY: The Ford Foundation. February, 1988.

> The authors cite the conclusion reached by Robert Taggart, an employment and training expert, that the most successful employment and training programs operate in multiple sites with "a central body that sets standards and materials, maintains quality control, and trains and certifies local staff."
>
> They maintain that "franchise programming models...represent the optimal mix of centralized accountability, networking, and quality control. Franchises also encourage local flexibility, leadership, and creativity. The average results obtained by these franchised

programs always exceed the average obtained by many independent, unconnected local programs." Among the effective franchised programs that the authors cite are Jobs for America's Graduates, Supported Work, and Ventures in Community Improvement, a construction-training program.

Branch, A. 1987. op. cit.

Westat, Inc. 1985. op. cit.

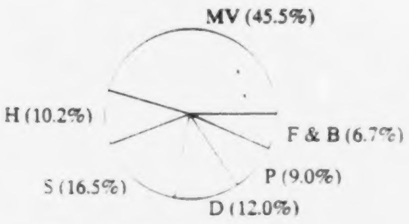
Mallar, C., et al. 1982. op. cit.

Congressional Budget Office. 1982. op. cit.

PART II

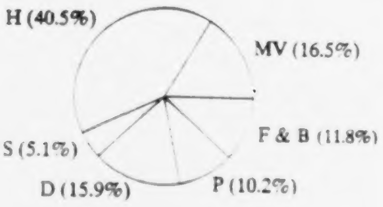
Injury-Related Deaths due to Selected Causes Among Males Ages 19 and Younger, By Race, 1986

White Males



9586 Injury Deaths due to These Causes
12455 Total Injury-Related Deaths

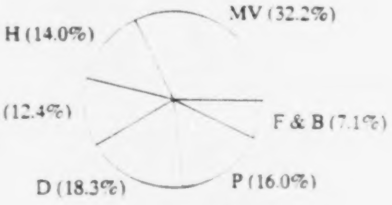
African-American Males



2376 injury Deaths to These Causes
2873 Total Injury-Related Deaths

MV	-Motor Vehicle Occupant Incident
F & B	-Fire and Burns
P	-Pedestrian Incident
D	-Drowning
S	-Suicide
H	-Homicide

Other Males

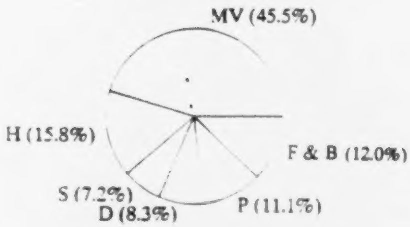


394 Deaths due to These Causes
496 Total Injury-Related Deaths

Source: Rodriguez, J.G. and Brown, S.T. "Childhood Injuries in the United States." American Journal of Diseases in Children. Vol. 144. Table 5. June 1990.

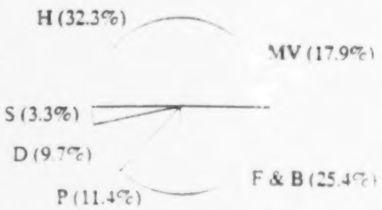
Injury-Related Deaths due to Selected Causes Among Females Ages 19 and Younger, By Race, 1986

White Females



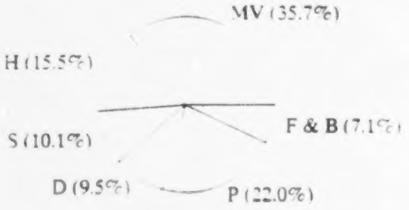
4308 Injury Deaths due to These Causes
5129 Total Injury-Related Deaths

African-American Females



1076 Injury Deaths to These Causes
1257 Total Injury-Related Deaths

Other Females



168 Deaths due to These Causes
201 Total Injury-Related Deaths

MV	-Motor Vehicle Occupant Incident
F & B	-Fire and Burns
P	-Pedestrian Incident
D	-Drowning
S	-Suicide
H	-Homicide

Source: Rodriguez, J.G. and Brown, S.T. "Childhood Injuries in the United States." American Journal of Diseases in Children. Vol. 144. Table 9. June 1990.

CHILDHOOD INJURY PREVENTION

Injury is the leading cause of death among children after the first few months of life. Each year, more than 22,000 children ages 0 to 19 die from injuries. Of these, more than 8,000 injury-related deaths occur among children ages 1 to 14. For each injury death, an additional 45 children are hospitalized, and 1,300 visit emergency rooms for treatment of non-fatal injuries.

The cost of these deaths and injuries for children ages birth to 15 are estimated to exceed $14 billion annually in direct medical expenditures, long-term care, and lost productivity due to premature death. The cost of future lost productivity alone for the 22,000 deaths among children and adolescents is estimated to be $8.3 billion in 1985 dollars. The vast majority of these injuries and deaths could have been prevented.

Injury causes almost 40% of the deaths among children ages 1 to 4 and almost 70% of all deaths of children ages 5 to 19. The major categories of unintentional injury among children are traffic (including motor vehicle occupant and pedestrian), burns, drowning, poisoning, firearms, and falls. Injury has surpassed diseases as the leading cause of childhood mortality and disability.

Minority and low-income children are at greatest risk of accidental injury and death. Injury death rates for African-American children are almost twice the rates for white children. Native American children are at particularly high risk of accidental death from automobile accidents and drowning.

There are a myriad of strategies to prevent injuries and their effects. Prevention measures aim to reduce incidence of injury; other measures target reducing the severity of injuries if they do occur. The most commonly used strategies are education, regulation and legislation.

Federal injury prevention efforts are established and regulated under the National Traffic and Motor Vehicle Safety Act and the Consumer Product Safety Act. The Centers for Disease Control (CDC) receives funds for the Division of Injury Control, which administers research and demonstration grants. The Consumer Product Safety Commission estimates that more than one-half of its funding was used for childhood injury-related activities. The Bureau of Maternal and Child Health, Department of Health and Human Services, also awards injury research and control grants.

Other sources of funding for injury prevention efforts include the National Highway Transportation Safety Administration, which conducts injury research and funds state injury prevention efforts, and the Childhood Injury Prevention Program housed at the National Institute of Child Health and Human Development.

A 1987 survey of state health agencies found that only ten had comprehensive injury prevention programs. Most devoted less than one-half of one percent of the state's annual health department budget to injury prevention.

Injury prevention programs have been found associated with

Reduced risk of injury and less severe injuries

Heightened safety knowledge and behavior by children and families

Cost effectiveness

- Cost savings from the mandatory use of child automobile safety restraints in just one state for two years estimated at more than $2 million.

STUDIES

Reduced Risk of Injury and Less Severe Injuries

Miller, C.A., et al. Monitoring Children's Health. Key Indicators. 2nd edition. Washington, DC: American Public Health Association. 1989.

> "Restrained children are 50-70% less likely to be injured or killed in an auto accident than unrestrained children. The rate of restraint usage for children younger than age five rose from 6% in 1980 to 40% in 1986. Children who survived an auto accident were more likely to have been restrained than those who died -- 45% versus 26%. Fatality rates for motor vehicle occupants are almost three times higher in low-income areas than in areas with higher per capita income. Poorer roads, older vehicles, and poorer emergency and medical care all contribute to the higher death rates. Additionally, teenage drivers in high-income areas use seat belts at more than three times the rate of teenage drivers in low-income areas."

Thompson, R.S. "A Case-Control Study of the Effectiveness of Bicycle Safety Helmets." The New England Journal of Medicine. Vol. 320. No. 21. 1989.

> Patients who received treatment for head injuries sustained while bicycling were compared with control groups of patients seen for non-head injuries. Analysis showed that holding other factors constant, riders with helmets had an 85% reduction in their risk of head injury and an 88% reduction in brain injury. Concludes that helmets are highly effective in injury prevention, and "particularly important for children, since they suffer the majority of serious head injuries from bicycling accidents."

DiGuiseppi, C.G. "Bicycle Helmet Use by Children: Evaluation of a Community-wide Helmet Campaign." Journal of the American Medical Association. Vol. 262. No. 16. October 1989.

> Assessment of the effect of Seattle helmet campaign that was comprised of public service announcements appearing in various media, a school-based bicycle safety campaign and distribution of coupons to reduce helmet cost. Observations of 9,827 children up to 16 months post-campaign showed helmet use in Seattle increased from 5.5% before the campaign to 15.7% afterward, while it increased from 1% to 2.9% in a control city. Concludes that by increasing helmet use, the program reduced risk of bike-related head injury and death among children.

Chang, A. "Injuries Among Preschool Children Enrolled in Day-Care Centers." Pediatrics. Vol. 83. No. 2. 1989.

> Study of 423 injury incidents among preschool children in Los Angeles day-care centers found incidence rate of 19.7 injuries per 1,000 child-years. "Three of four injuries were considered preventable by training and/or education."

Guyer, B. "Prevention of Childhood Injuries: Evaluation of the Statewide Injury Prevention Program (SCIPP)." American Journal of Public Health. Vol. 79. No. 11. 1989.

> Reduction of motor-vehicle occupant injuries were the most significant outcomes. Reported use of child auto restraints was 22.2% higher in households that were exposed to prevention

programs than in those that were not exposed. The incidence of motor vehicle injury decreased 54% in intervention communities, while it rose in the others. Safety behaviors for burns and poisonings increased with exposure to prevention messages.

Evaluation of comprehensive, community-based, childhood injury prevention program targeting burns, falls, motor-vehicle injuries, poisonings, and suffocations among children ages 0-5. Compared with a control group of matched communities, households that reported participation in education programs along with exposure to media campaign had increased safety knowledge and behaviors.

U.S. Office of Technology Assessment. Healthy Children: Investing in the Future. Washington, DC: U.S. Office of Technology Assessment. 1988.

State laws requiring the use of child restraints in automobiles led to a 36% decline in motor-vehicle deaths among children under 5 between 1980 and 1984.

Examines the effectiveness and costs of strategies for "promoting and maintaining the health of children and to identify strategies whose implementation could substantially improve children's health or lower health care costs." Accident prevention is identified as a preventive strategy that has a "high payoff in relation to initial costs."

Decker, M.D. "The Use and Efficacy of Child Restraint Device: The Tennessee Experience, 1982 and 1983." Journal of the American Medical Association. Vol. 252. No. 18. 1984.

State-mandated use of child restraint devices for children under four took effect in 1978. Analysis of accident reports in 1982 and 1983 showed children not in restraint devices were 11 times more likely to die in accidents than those in restraint devices. Injuries sustained in accidents were more severe for children not in restraint devices.

The savings resulting from use of child restraints is estimated to exceed $2 million in the state in those two years alone. Presenting a $40 restraint device to each newborn in the state would cost $2.6 million annually and would save an estimated $8.4 million in direct medical costs.

Heightened safety knowledge

Guyer, B. 1989. op. cit.

Cost effectiveness of injury prevention

Rodriguez, J.G. and Brown, S.T. "Childhood Injuries in the United States." American Journal of Diseases of Children . Vol. 144. June 1990.

> In 1986, injury caused more than 22,000 deaths among children ages 0 to 19. Cost of future lost productivity for 22,000 deaths estimated at $8.3 billion in 1985 dollars.

Rice, D.P. Cost of Injury in the United States: A Report to Congress. San Francisco, CA: Institute for Health and Aging, University of California and Injury Prevention Center, The Johns Hopkins University. 1989.

> The total lifetime cost of injuries sustained by children birth to 15 in 1985 is estimated at more than $14 billion. Injury outranks other diseases and conditions in years of life lost and direct medical costs, yet funding for research is far less than that spent on other health problems.

U.S. Office of Technology Assessment. 1988. op. cit.

Lapidus, G. The Connecticut Childhood Injury Surveillance System. Final Report. The Connecticut Coalition to Prevent Childhood Injuries. September 1988.

> Report on findings of Connecticut's newly established surveillance system designed to measure injury morbidity and mortality. In 1986, the cost of acute care injury related hospitalizations for Connecticut children ages 0-19 totaled more than $18 million. The cost for injuries due to falls was nearly $3 million; for burns the total was more than $1.5 million.

Malek, M., et al. "The Cost of Medical Care for Injuries to Children" (draft). Cambridge, MA: Harvard University. School of Public Health. 1990.

> Study estimated the direct medical cost of injuries to children and youth. In 1987, for children ages 0-19, the mean cost of hospitalized cases was $5,094, and emergency room cases $171. The U.S. population projection for annual cost of injury was $5.1 billion.

Decker, M.D. 1984. *op. cit.*

Children, Youth, and Families of the Mountain West. Hearing Report, U.S. House of Representatives. Select Committee on Children, Youth, and Families. Washington, DC. 1984.

> Use of child safety restraints produces dramatic reduction in rate of automobile injury, and the severity of those injuries. The Pediatric Trauma Center in Salt Lake City demonstrated cost savings of use of restraints: Average cost of treating minor injuries of the restrained child was $105, while average cost for unrestrained child who was hospitalized was $7,776 and $12,575 for the unrestrained child who died.

LEAD SCREENING AND REDUCTION

Lead poisoning is considered to be among the most preventable of childhood syndromes. High lead exposure causes decreased intelligence, developmental disturbances, and behavioral disorders. Screening is essential to detect elevated blood levels, as these effects may occur in children who show no obvious signs of lead poisoning. In most cases, the onset of symptoms means that brain damage has already occurred.

It is estimated that from three to four million preschool children have blood lead levels above 15 ug/dL (micrograms per deciliter), a level associated with the onset of early detectable adverse effects, and 400,000 infants are born with toxic blood lead levels every year. Recent investigations have found rates of 20% and higher in some urban areas. Nearly 200,000 children under age six have blood lead levels greater than the current Centers for Disease Control (CDC) standard of 25 ug/dL.

Children and fetuses are particularly vulnerable to lead because of the sensitivity of their rapidly developing nervous systems. Children of poor families are at greater risk of adverse effects of lead because of exposure to decaying paint. In addition, poor nutrition magnifies the effects of lead.

An estimated three million tons of lead from paint remain in dwellings. In addition to lead in deteriorating paint in old buildings, lead is found in dust, water sources, and in soils. Children in more affluent homes are at continuing risk as well, as many middle- and upper-class families remodel older homes.

Annual screening can monitor blood lead levels and alert health professionals to asymptomatic or borderline cases, as well as undetected cases of poisoning. Two types of screening exist: Free erythrocyte protoporphyrin (FEP) and blood-lead. Although it is nearly four times as expensive, blood-lead is the only test accurate below levels of 40 ug/dL. In fact, research has found that between 25-40 ug/dL, FEP gives false negatives in 60% of the children with elevated lead levels. The lowering of the current CDC threshold for lead poisoning from 25 ug/dL to the 10-15 range will necessitate blood-lead being used as the primary measure.

Treatments for children with elevated blood lead levels may include removal of the child from the source of lead, total lead abatement from houses and the environment, improving nutrition, and/or chelation therapy. Chelation treatment is not without risks, but even at its high cost, early treatment can reverse acute symptoms and progression of neurological damage by removing the lead from the child's body. In addition, it avoids the extensive costs of more serious medical treatment, remedial education, or psychological testing.

Federal involvement in lead screening programs began in 1971 with the Lead Based Paint Poisoning Prevention Act, which provided the first grants for screening and treatment through the Department of Health, Education and Welfare. In 1981, funding was restructured through the Maternal and Child Health Block Grant Program, allowing individual states to decide lead screening allocations. Today, fewer than half of the states have active screening programs. The Lead Contamination Control Act of 1988 restored line item funding for screening in hopes of reactivating those efforts.

The costs of excessive lead exposure fall into three categories: Direct medical care expenditures, diagnosis and later special education costs, and reduced productivity of the future workforce.

Studies of lead poisoning show

Adverse health, development and education effects of lead poisoning include

- Impaired IQ
- Reduced birth weight
- Short-term memory loss
- Impaired reaction time and concentration powers
- Learning disabilities ranging from reading problems and delayed speech to severe retardation
- Seven-fold increase in risk of not graduating from high school

Cost-Effectiveness

- Total savings in medical care and compensatory education from reducing the neurotoxic effects of lead on children in the U.S. were estimated to be more than $500 million (in 1983 dollars) annually from 1986 to 1988.

STUDIES

Adverse Health, Development and Education Effects

U.S. Office of Technology Assessment. Neurotoxicity: Identifying and Controlling Poisons of the Nervous System. Washington, DC: U.S. Office of Technology Assessment. April 1990.

> According to the National Academy of Sciences, 12% of the 63 million children under 18 in the United States suffer from one or more mental disorders; exposure to a toxic substance such as lead is one of the risk factors which lead to such disabilities.
>
> Costs attributable to childhood exposure to lead include: Direct medical care expenditures, special education and institutionalization for those with permanent effects, and costs to society in terms of reduced production from future labor force members.
>
> Using cost-benefit analysis, the total savings in medical care and compensatory education from reducing the neurotoxic effects of lead on children in the U.S. were estimated to be more than $500 million (in 1983 dollars) annually from 1986 to 1988.

Needleman, H.L. "The Long-Term Effects of Exposure to Low Doses of Lead in Childhood." The New England Journal of Medicine. Vol. 322. No. 2. January 1990.

> A follow-up on 132 young adults studied more than ten years ago as school children. Original findings had found neurobehavioral functioning to be strongly affected by lead levels. Reexamination found those who had higher lead levels in their teeth at ages 6 and 7 to be seven times more likely to drop out of school and nearly six times more likely to have a reading disability. Other lasting effects of high lead exposure included increased absenteeism, lower class standing, and deficits in fine motor skills, reaction time, and hand-eye coordination.

Coppens, N.M., et al. "The Relationship Between Elevated Lead Levels and Enrollment in Special Education." Family and Community Health. Vol. 12. No. 4. 1990.

Using matched cohorts, found that children with history of elevated blood lead were more likely to be enrolled in special education. Of those enrolled in special education, those with higher blood lead levels were more likely to be classified as more severely handicapped. "Because it is virtually impossible to provide a true lead-free environment, it is essential that children be screened early for the detection of lead in their bodies."

Childhood Lead Poisoning in California: Causes and Prevention. Interim Report to the California State Legislature. June 1989.

In accordance with the California Childhood Lead Poisoning Prevention Act of 1986, this report estimates the extent and causes of childhood lead poisoning in California.

The average blood lead level was found to be approximately 11 ug/dL in the areas surveyed (Oakland and Los Angeles), ranging from 3 to 43 ug/dL. In Oakland, 19.1% of children screened had blood levels above 15 ug/dL; in Los Angeles, the proportion was 20%. Males had significantly higher mean blood levels than females; children ages 36-41 months had higher mean blood levels than other children. Those with lowest income and least access to medical care had the highest blood lead levels. The study found high correlation between soil and paint lead levels and blood lead levels in children.

Recommendations include annual screening of high risk populations, from age 1 through age 5, and use of the blood lead test as primary indicator.

Dietrich, K.N. "Low-Level Fetal Lead Exposure Effect on Neurobehavioral Development in Early Infancy." Pediatrics. Vol. 80. No. 5. November 1987.

Longitudinal study of the effects of chronic low- to moderate-lead exposure (below CDC threshold) on child development. Using 305 lower-socioeconomic status women, researchers tracked blood lead levels through pregnancy and infancy of their children. Blood lead levels were directly related to deficits on developmental indices; boys and infants from the poorest homes showed the most serious effects at six months.

Cost Effectiveness

U.S. Office of Technology Assessment. April 1990. op. cit.

Miller, C.A., et al. Monitoring Children's Health: Key Indicators. American Public Health Association. Washington, DC. 1989.

> Cites cost-benefit analyses conducted by the U.S. Environmental Protection Agency (EPA). EPA calculated that "the removal of lead from gasoline can produce substantial savings resulting from improved health of both children and adults." Agency researchers projected that a 90% phasedown of lead in gasoline from 1985 to 1992 would result in cost savings related specifically to improved child health at $2.5 billion.
>
> The second EPA cost-benefit analysis concluded that a reduction of lead in drinking water from the EPA drinking water standard of 50 ug/l to 20 ug/l would cost about $230 million annually and result in benefits to children's health ranging from $109 million to $296 million annually, depending on the method used to estimate the costs of cognitive damage. EPA also estimated the following annual reduction in the number of children at risk: 29,000 fewer children requiring medical treatment; 241,000 fewer children losing 1 to 5 points IQ points; 29,000 fewer children requiring compensatory education; 82,000 fewer children at risk of growth stunting; and 82,400 fewer children at increased risk of hematological effects.

Johnson, K.A. Testimony before the Subcommittee on Health and the Environment, Committee on Energy and Commerce. U.S. House of Representatives. Washington, DC. February 29, 1984.

> Federal spending for all lead screening programs was $8.5 million in 1979. In that year the social cost (medical care, special education, and later lost adult wages) of excessive lead exposure was estimated at $1 billion.

SMOKING CESSATION PROGRAMS FOR PREGNANT WOMEN

Researchers estimate that 21-32% of pregnant women in the United States smoke during their pregnancies. Smoking during pregnancy is most prevalent among young, unmarried, white women with limited education. According to one recent study, pregnant women who smoke less than a pack of cigarettes a day increase their risk of having a low birthweight baby (less than 5-1/2 pounds or 2,500 grams) by 53%. Those who smoke a pack or more a day increase the risk by 130%. Low birthweight babies account for nearly 7% of births each year, but constitute about 57% of infant deaths.

Smoking'cessation programs targeted to pregnant women are designed to decrease the adverse health effects associated with smoking, including low birthweight, spontaneous abortion, premature rupture of the membranes, abruptio placentae and placentae previa. Smoking presents additional hazards for pregnant adolescents who are already at greater risk from the biological, educational and economic factors associated with childbearing at a young age. Women who stop smoking before pregnancy or during the first three to four months of pregnancy reduce their risk of having a low birthweight baby to that of women who never smoked.

Studies indicate that a reduction in smoking during pregnancy would result in

Reduced adverse health effects during the prenatal, neonatal and postnatal periods, including reductions in the

- Number of fetal and infant deaths by 5%-10%
- Number of low birthweight babies by 20%-35%
- Number of premature births by 8%-15%
- Risk of Sudden Infant Death Syndrome (SIDS)
- Risk of neurological abnormalities, including minimal cerebral dysfunction
- Number of pregnancy-related complications, including abruptio placentae, placenta previa, bleeding during pregnancy, prolonged premature rupture of membranes, and ectopic pregnancy

Smoking cessation programs result in significant quit rates among pregnant women

- Smoking cessation programs have proven to be modestly successful, with quit rates ranging from 6% to 32%; structured smoking cessation programs designed specifically for pregnant women have better quit rates and are low in cost.

Cost effectiveness

- The cost of providing smoking cessation help to the estimated 350,000 pregnant smokers seen in public health clinics would be approximately $1.75 million ($5.00 per individual) compared with an estimated $37 million in excess low birthweight costs, producing a cost:benefit ratio of $1:$21.

- The cost of neonatal care for infants born to smokers averages $189-$288 more than for infants born to nonsmokers.

- Health care costs associated with low birthweight babies can average between $14,000 and $30,000.

STUDIES

Reduced Adverse Child Health and Developmental Effects of Smoking

U.S. Department of Health and Human Services. Public Health Service. The Health Benefits of Smoking Cessation. A Report of the Surgeon General. 1990.

> Review of research indicates that "women who stop smoking before pregnancy or during the first three to four months of pregnancy reduce their risk of having a low birthweight baby to that of women who never smoked." Women who smoke only during their first trimester of pregnancy have a "30% increased risk of having a low birthweight baby;...women who smoke during the first two trimesters have a 70% higher risk, and women who smoke during their entire pregnancy have 90% increased risk.
>
> "Recent estimates suggest that the elimination of smoking during pregnancy could prevent about 5% of perinatal deaths, about 20% of low birthweight births, and about 8% of preterm deliveries....In

> groups with a high prevalence of smoking (e.g., women who have not completed high school), the elimination of smoking during pregnancy could prevent about ten percent of perinatal deaths, about 35% of low birthweight births, and about 15% of preterm deliveries....Many women who do not quit smoking during pregnancy reduce their daily cigarette consumption; however, reduced consumption without quitting may have little or no benefit for birthweight....(F)or white women, the risk of fetal and infant mortality is significantly elevated for the infants of women who smoked in all categories of low birthweight, even after adjustment for marital status, education, age, and parity."

Windsor, R., et al. The Handbook to Plan, Implement, and Evaluate Smoking Cessation Programs for Pregnant Women. White Plains, NY: March of Dimes Birth Defects Foundation. (In Press)

> Review of studies shows that "infants born to women who smoke during pregnancy have significantly lower birthweight than babies born to nonsmokers -- 150-250 grams....Approximately 25% of low birthweight is associated with maternal smoking....Low birthweight babies account for over 6% of births each year, but produce approximately 57% of the infant deaths....Pregnant patients who smoke less than a pack a day increase their risk of having a low birthweight baby by 53%. Pregnant patients who smoke a pack or more a day increase the risk by 130%....The Institute of Medicine estimates that for every dollar spent in providing adequate prenatal care to the women in public assistance programs who were at high risk for delivering a (low birthweight) infant, e.g. pregnant smokers, $3.38 could be saved in direct medical care costs of (low birthweight) infants."

Fried, P.A. and Watkinson, B. "36- and 48-Month Neurobehavioral Follow-up of Children Prenatally Exposed to Marijuana, Cigarettes, and Alcohol." Developmental and Behavioral Pediatrics. Vol. 11. No. 2. April 1990.

> Study indicated that at 36 months of age, there was a significant negative correlation between children's score on a verbal subscale test and heavy prenatal smoking (more than 15 mg. nicotine/day) by mother. At 48 months, children of the heavy-smoking group had poorer verbal skills than either the light or nonsmoking groups.

Newman, L. Preventable Causes of Learning Impairment. (draft) Denver, CO: Education Commission of the States. 1990.

> Review of studies shows that children born to women who smoked during their pregnancies were more likely than children of nonsmokers to experience errors in copying, were more clumsy, and were more likely to be diagnosed as handicapped or needing special education. In addition, the studies showed that smoking during pregnancy is associated with deficits in stature, cognitive development, and educational achievement among young children. The incidence of children with these problems was more prevalent among heavier smokers.

Mayer, J., et al. "Health Promotion in Maternal and Child Health Care," in Universal Maternity Care: A Prescription for Ensuring Access. Kotch, J.B., et al. (eds.) Washington, DC: American Public Health Association. (In Press)

> Review of studies shows that poor birth outcomes are 20-60% more likely among smokers. Several studies show 10% of all fetal and infant deaths are attributable to maternal smoking. Study of Missouri's entire population of births over a period of years reported a 25-56% greater likelihood of mortality among infants of smoking mothers. Birthweight differences of 150-250 grams between infants of smokers and nonsmokers has been documented. Smoking also produces differences in rate of premature birth and results in an increased incidence of spontaneous abortion. One study reported that the rate of Sudden Infant Death Syndrome (SIDS) was 1.9 times higher for infants exposed to passive smoke and that the respiratory disease death rate was 3.4 times greater. Other studies suggest a correlation between maternal smoking and delayed childhood development reading, math comprehension, and child height for weight. Smoking has increasingly become the habit of teenaged, unmarried and lower-educated pregnant women.
>
> Smoking cessation programs have proven to be modestly successful, with quit rates ranging from 6% to 32%. Structured programs tend to be brief in duration, inexpensive to operate and create better quit rates.
>
> A home-based program that cost $11.75 per patient compared to average higher hospitalization costs for infants of mothers who smoke resulted in a benefit-cost ratio of 2.8:1.

> It is estimated that cessation interventions could be delivered to all pregnant women in the U.S. at a cost of only $7 million. The projected cost-benefit of providing smoking cessation programs to 350,000 low-income public prenatal clinic smokers, with a $5 cost per patient and a projected 12% quit rate, would save $21 in infant health care costs for every $1 invested in smoking cessation.

Handler, A., et al. "The Relationship of Smoking and Ectopic Pregnancy." American Journal of Public Health. Vol. 79. September 1989.

> A study of 4,921 women conducted at the University of Illinois Perinatal Network Hospitals from 1983 to 1987 indicated that women who reported smoking during pregnancy had a greater than twofold risk of ectopic pregnancy compared to women who never smoked.

U.S. Department of Health and Human Services. Public Health Service. Reducing the Health Consequences of Smoking. Twenty-five Years of Progress. A Report of the Surgeon General. 1989.

> The Surgeon General's report reiterates research findings contained in earlier reports documenting the harmful effects of smoking on pregnant women and their developing fetuses: (1) the association between maternal smoking and low birthweight babies, increased incidence of prematurity, spontaneous abortions, stillbirths, and neonatal deaths (1969); (2) the retarding influence on fetal growth (1971); (3) the probable cause of increased late fetal mortality and infant mortality (1973); (4) a correlation between smoking and abruptio placentae, placenta previa, bleeding during pregnancy, and prolonged premature rupture of membranes and impaired physical and intellectual development of offspring (1977-78); (5) a correlation between smoking and sudden infant death syndrome (1979).

Weinberg, C., et al. "Reduced Fecundability in Women with Prenatal Exposure to Cigarette Smoking." American Journal of Epidemiology. Vol. 129. 1989.

> A study of more than 200 U.S. couples found that a woman whose mother smoked while pregnant with her is about one-half as fecund as a woman not exposed to cigarette smoke in utero.

Kleinman, J., et al. "The Effects of Maternal Smoking on Fetal and Infant Mortality." American Journal of Epidemiology. Vol. 127. 1988.

> Using a data base of 360,000 births, 2,500 fetal deaths and 3,800 infant deaths, the researchers found that infants born to women who smoked less than one pack of cigarettes per day had a 25% greater risk, and those who smoked one or more packs per day had a 56% greater risk, of infant mortality than nonsmokers. The researchers estimate that if all pregnant women stopped smoking, the number of fetal and infant deaths would be reduced by approximately 10%.

Oster, G., et al. "Maternal Smoking During Pregnancy and Expenditures on Neonatal Health Care." American Journal of Preventive Medicine. Vol. 4. Number 4. 1988.

> Study found that maternal smoking during pregnancy was responsible for 35,816 low-weight births (14.5% of all low-weight births) in the United States in 1983. The research also showed that nearly 7% of admissions to neonatal intensive care units were a result of maternal smoking. These admissions were responsible for approximately 8.5% of total expenditures for neonatal intensive care. The average cost of neonatal care for infants born to smokers was $189-$288 more than for those of nonsmokers. Earlier studies show that a reduction in smoking during pregnancy significantly increases infant birthweight.

McIntosh, I.D. "Smoking and Pregnancy: Attributable Risks and Public Health Implications." Canadian Journal of Public Health. Vol. 75. March/April 1984.

> The author's research on the impact of smoking on pregnancy produces findings consistent with earlier studies that show that one to two of every ten unsuccessful pregnancies due to spontaneous abortion, stillbirth or neonatal death would have been successful in the absence of smoking.

U.S. Department of Health and Human Services. Public Health Service. The Health Consequences of Smoking for Women. A Report of the Surgeon General. 1980.

> This report of the Surgeon General summarizes studies

documenting the adverse health effects of smoking by pregnant women on their developing fetuses. Research shows that babies born to women who smoke during pregnancy are, on the average, 200 grams lighter than babies born to comparable women who do not smoke, independent of other factors such as race, maternal size or socioeconomic status. Children of smoking mothers have slight, but measurable deficiencies in physical growth, intellectual and emotional development and behavior. There is a statistically significant association between maternal cigarette smoking and spontaneous abortion and congenital malformations.

Smoking Cessation Programs Result in Significant Quit Rates Among Pregnant Women/ Improved Birth Outcomes

Mayer, J.P., et al. 1990. op. cit.

Mayer, J.P., et al. "A Randomized Evaluation of Smoking Cessation Interventions for Pregnant Women at a WIC Clinic." American Journal of Public Health. Vol. 80. January 1990.

> Pregnant smokers attending a local health department WIC clinic who received a 20-minute counseling session that included risk information and behavior change components had a higher "quit rate" during the last month of pregnancy (11%) and postpartum (7%) than those receiving only standard printed smoking cessation material (3% prenatal and 0% postnatal). Study demonstrated effectiveness of smoking cessation program provided through WIC program.

Ershoff, D.H., et al. "A Randomized Trial of a Serialized Self-Help Smoking Cessation Program for Pregnant Women in an HMO." American Journal of Public Health. Vol. 79. February 1989.

> A self-help smoking cessation program for pregnant women was successful in achieving a 22.2% cessation rate from the 20th week of pregnancy through delivery compared with 8.6% who received only usual care. The program primarily consisted of printed materials sent through the mail.

Windsor, R., et al. "The Effectiveness of Smoking Cessation Methods for Smokers in Public Health Maternity Clinics: A Randomized Trial." American Journal of Public Health. Vol. 75 December 1985.

> The researchers tested two smoking cessation programs -- The American Lung Association's (ALA) "Freedom from Smoking" and "A Pregnant Woman's Self-Help Guide to Quit Smoking" -- to determine their effectiveness. The subjects of the research were 309 pregnant women from three public health maternity clinics. Of the women assigned to the ALA approach, 6% quit and 14% reduced their smoking. Of those using the materials specifically designed for pregnant women, 14% quit and 17% substantially reduced their smoking. The researchers report that smoking cessation materials specifically tailored for pregnant women are likely to be more effective in changing smoking behavior.

Sexton, M.J., et al. "A Clinical Trial of Change in Maternal Smoking and Its Effect on Birth Weight." Journal of the American Medical Society. Vol. 251. February 17, 1984.

> This research project was one of the first controlled experiments to test the hypothesis that a reduction of smoking during pregnancy produced a favorable change in the birthweight of the infant. The researchers found that high-risk pregnant women who participated in a smoking cessation program consisting of one personal contact followed by telephone and mail contacts were twice as likely to quit smoking as the control group that received no smoking intervention. The infants born to mothers in the treatment group had a statistically significant higher birthweight (92 grams higher) than those born to mothers in the control group. Babies born to mothers in the treatment group were also longer.

Cost Effectiveness

Mayer, J., et al. 1990. op. cit.

Mayer, J., et al. January 1990. op. cit.

Oster, G., et al. 1988. op. cit.

Windsor, R.A., et al. "A Cost-Effectiveness Analysis of Self-Help Smoking Cessation Methods for Pregnant Women." Public Health Reports. Vol. 103. 1988.

> The cost effectiveness of three different smoking cessation programs for pregnant women were analyzed. A self-help approach using materials specifically designed for pregnant women was calculated to cost $7.13 per patient to administer and had a quite rate of 14%. A self-help approach that did not make use of materials designed specifically for pregnant women also cost $7.13 but resulted in only a 6% quit rate. The control group, which received only standard clinic advice about smoking, cost $2.08 and produced a 2% quit rate. The calculated cost-effectiveness of the three approaches, based on the cost of the program per patient and the resulting quit rate, was: $104/quit for the control group, $118.83/quit for the group receiving nonspecific smoking cessation materials and only $50.93/quit for the group that received materials targeted to pregnant women.

HOME VISITING

In the United States, more than 4,500 programs have been identified that employ home visiting to provide health, social, or educational services to families. Home visiting programs are universally available in many European countries as an integral part of the health care delivery system. The programs possess a variety of goals; what unites them is their unique delivery. As an alternative to, or in cooperation with, an array of health and social service agencies, these programs bring important services and social support to the homes of those most in need.

In response to concerns regarding lack of access to and use of health care by pregnant women and infants, many communities have initiated programs of home visiting during pregnancy and early infancy in an attempt to reduce barriers to care, prevent low birthweight, and promote healthy infant development. Using home health aides, trained community workers, paraprofessionals, and nurses, home visiting programs have begun to address a myriad of issues which keep families from obtaining adequate care.

The Omnibus Budget Reconciliation Act of 1989 (P.L. 101-239) authorizes funding through the Maternal and Child Health Block Grant for home visiting demonstration programs. Congress is also considering prenatal and postpartum home visiting as an optional service under Medicaid. This approach to the delivery of health and social services has faced limited evaluation; some early reports indicate promising program outcomes at low cost.

Home visiting programs also have been found to be successful in reducing the incidence of child abuse and neglect. These programs can successfully link families in crisis to social service agencies, and provide an ongoing supportive relationship for the family. Education regarding child development and counseling for social and health issues can be a part of home visiting.

Home visiting has also been shown to be effective in fostering the development of premature and low birthweight children, through an ongoing home-based curriculum of activities for the child and education for parents.

Home visiting programs have been associated with

Improved prenatal care

- Home visitation to pregnant teens in rural South Carolina produced statistically significant improved prenatal care

Increased birthweights

- Home visits by nurses to pregnant teenagers resulted in an average improvement of 395 grams in birthweight

Improved IQ scores and enhanced child development

- Comprehensive home education program for low birthweight infants begun shortly after birth produced IQ gains of 6.6-13.2 points after three years

Reduced child abuse and neglect

Cost effectiveness

STUDIES

Improved Prenatal Care

Heins, H. "Social Support in Improving Perinatal Outcome: The Resource Mothers Program." Obstetrics and Gynecology. Vol. 70. No. 2. August 1987.

> Home visiting by trained "resource mothers" to pregnant teens in 16 rural counties in South Carolina provided social and personal support, as well as transportation to prenatal care and well-baby checks. Findings were statistically significant showing improved prenatal care attendance, increased WIC enrollments, and well-child visits. Percent of mothers at risk of delivering low birthweight child decreased from 10.9% to 5.9%. Percentage of mothers returning to an educational setting was 49%. Cost of resource mother was $462 per teen.

Increased Birthweights

Olds, D.L. "The Prenatal/Early Infancy Project," in Fourteen Ounces of Prevention. A Casebook for Practitioners. Price, R.H., et al. (eds.) Washington, DC: American Psychological Association. 1988.

Program of nurse home visitation was designed to prevent wide range of maternal and child health problems. Weekly visits to 400 women in semi-rural New York county focused on women's prenatal health habits, infant caregiving skills, use of informal social support, and linkages to formal service agencies. Control group given only transportation and screening. During pregnancy, women in nurse visiting group made better use of formal services, received greater social support, had better diets and reduced their smoking. For teens, the nurse-visited group saw an average improvement of 395 grams in birthweight. Other significant findings included reduction in verified cases of child abuse and neglect in nurse-visited group.

Heins, H. 1987. op. cit.

Improved IQ Scores and Enhanced Child Development

The Infant Health and Development Program. "Enhancing the Outcomes of Low-Birth-Weight, Premature Infants." Journal of American Medical Association. Vol. 263. No. 22. June 1990.

Study of 985 premature, low birthweight infants, born to mothers of various educational and ethnic backgrounds in eight cities, showed that a comprehensive education program begun just after birth significantly improved the infants' cognitive and behavioral development. Intervention consisted of weekly home visits during first year of child's life by trained teachers following child development curriculum. At age 1, children began participation in daily classes at child development centers. At age 3, intervention group showed IQ gains of 6.6-13.2 points. Children who did not receive the intervention were almost three times more likely to have IQ scores indicating mental retardation.

Powell, C. and Grantham-McGregor, S. "Home Visiting of Varying Frequency and Child Development." Pediatrics. Vol. 84. No. 1. July 1, 1989.

Two studies of home visiting programs to low-income children showed increases on mental development scale. Children visited on a weekly basis showed marked improvements on tests in the areas of performance, hearing and speech, and hand and eye. As the frequency of home visiting increased from none to weekly, the benefits increased as well.

Reduction in Child Abuse and Neglect

Daro, D. Intervening With New Parents: An Effective Way to Prevent Child Abuse. Chicago, IL: National Committee for Prevention of Child Abuse. Working Paper Number 839. 1988.

> Review of home visiting programs concludes that "offering services in a client's home has a number of distinct advantages, particularly when the objective is to reduce the likelihood of maltreatment." Programs allow home visitor to work concretely with the parent-child relationship, and to provide service to those who are not comfortable with community facilities.
>
> Review of effectiveness of home visiting programs estimates cost savings. If these services reduced the level of serious physical abuse by only 20% savings would total $362 million annually in reduced foster care, hospitalization and medical care costs, rehabilitation services, juvenile court costs, and lost future productivity.

Barth, R.P., et al. "Preventing Child Abuse: An Experimental Evaluation of the Child Parent Enrichment Project." Journal of Primary Prevention. Vol. 8, No. 4. Summer 1988.

> Study of families at risk of child abuse showed that mothers involved in home visiting program before or following the birth of a child resulted in better prenatal care, birth outcomes, better reports of child temperament and better indicators of child welfare.

Multiple Program Benefits

Mayer, J., et al. "Health Promotion in Maternal and Child Health Care," in Universal Maternity Care: A Prescription for Ensuring Access. Kotch, J.B., et al. (eds.) Washington, DC: American Public Health Association. (In Press)

> Studies show home visiting produces positive benefits in reducing low birthweight and prematurity, better prenatal care utilization,

decreased accidents and child abuse, and improved physical and cognitive development for premature, low birthweight and malnourished infants. The Prenatal Early Intervention Program (PEIP) resulted in reduced smoking among those who smoked, higher infant birthweights to pregnant adolescents, less need for emergency room visits, and fewer reports of child abuse. In addition, home-visited women were more likely to complete schooling, gain employment, had fewer subsequent pregnancies and delayed the birth of additional children.

Study of low birthweight babies released from Philadelphia hospital and followed with home visiting program cost an average of $18,560 less per child than keeping the infant in the hospital for an average of 11 more days. Baltimore home visiting program cost $60,000 compared with an estimated $85,682 in reduced cost of inpatient and outpatient medical care.

United States General Accounting Office. Home Visiting: A Promising Early Intervention Strategy for At-Risk Families. HRD-90-83. July 1990.

Study reviews existing home visiting programs and their effectiveness. Concludes that home visiting can be an effective strategy for reaching at-risk families typically targeted for early intervention strategies. Evaluations "have shown that programs incorporating home visiting as a service delivery strategy can prevent families from needing later, more costly public supportive services." Suggests that the federal government's commitment to home visiting could be better coordinated and focused.

In further evaluation of the South Carolina Resource Mothers Program, the estimated cost for one resource mother in 1987 was found to be $15,715, and 80 teen mothers were served. In that same year, the cost of neonatal intensive care for one low birthweight infant was $13,616. "Since program evaluations show that teens visited by Resource Mothers have fewer low birthweight babies, program benefits exceeded program costs."

Goodwin, S.A. Testimony at hearing, Child Health: Lessons from Developed Nations. Select Committee on Children, Youth, and Families. Washington, DC: U.S. House of Representatives. March 20, 1990.

> Health visitors in England routinely visit all homes within ten days following the birth of a child to provide health promotion and preventive health care services to families. The health visiting service is free and is "well-known, universal and...non-stigmatizing." Home visits continue until child health care is handed over to the school nurse at 4 to 5 years of age. Visitors encourage immunizations, provide nutrition, child safety and health advice and social support. Families at increased risk of health or social difficulty or with special needs receive extra attention. The major costs associated with the program are for salaries, mileage allowances and automobiles used by the health visitors. Studies indicate "beneficial measurable effects in relation...to increased uptake of home safety advice, immunisation and breastfeeding, and in reduced hospital admissions and injuries to children known to be at increased risk of child abuse." In addition, the service monitors the health and welfare of children.

Olds, D.L., op. cit. 1988.

Seitz, V., et al. "Effects of Family Support Intervention: A Ten-Year Follow-up." Child Development. Vol. 56. 1985.

> Intervention included four coordinated components: Pediatric care, day care, developmental examinations, and home visiting. The home visiting team consisted of social workers, psychologists, and a nurse. The role of home visitors was "to provide close personal involvement by a professionally competent person in a convenient setting for the family" and to connect families with other service providers. A decade later, "intervention mothers were more likely to be self-supporting, and they had higher educational attainment and smaller family sizes than did control mothers. Intervention children had better school attendance, and boys were less likely to require costly special school services than were corresponding control children."
>
> Effects and savings resulting from a coordinated intervention including intensive home visiting were evaluated, comparing families that received the intervention to control families ten years after the conclusion of services. "The financial implications of the results were considerable, totaling about $40,000 in extra estimated welfare costs and documented school services costs needed by the 15 control families in the single year in which these follow-up data were collected."

Ross, G. "Home Intervention for Premature Infants of Low-Income Families." American Journal of Orthopsychiatry. Vol. 54. No. 2. April 1984.

> Home visiting program to low-income families following birth of low birthweight infant showed that children in the program scored significantly higher than control group on mental ability scales and families scored significantly higher on four of six factors of home environment and maternal interaction.

Cost Effectiveness

Mayer, J. 1990. op. cit.

United States General Accounting Office. July 1990. op. cit.

National Commission to Prevent Infant Mortality. Home Visiting: Open Doors for America's Pregnant Women and Children. Washington, DC. July 1989.

> "The evidence is mounting that home visiting programs can potentially reduce the overall costs of health care for pregnant women and children. The costs of home visiting programs can range from $100 per family per year to $3,400 per family per year (depending on the type of personnel used and intensity of service). These are minor expenditures per high-risk family given the potential short and long-term cost savings." Estimated annual savings of $487 million include prevention of costs of hospitalizations, rehabilitation, special education, and foster care for abuse and neglect victims.

Gadsby, J.W. "Meeting the Needs of Children in a Home Based Setting." Testimony of the U.S. General Accounting Office before the Senate Committee on Finance. Washington, DC: U.S. Senate. June 1989.

> "Based on preliminary work done in the U.S. and Europe, it seems that home visiting can be a cost-effective and efficient way to improve child health and decrease the risk of child abuse and neglect, and developmental delay." GAO recommends long term

funding for home visiting programs to make consistent use of this approach.

Daro, D. 1988. op. cit.

Seitz, V., et al. 1985. op. cit.

APPENDIX

APPENDIX

Program Participation Sources

Special Supplemental Food Program for Women, Infants, and Children (WIC)

Food and Nutrition Service. U.S. Department of Agriculture.

Prenatal Care

U.S. Department of Health and Human Services. National Center for Health Statistics. Advance Report of Final Natality Statistics. 1988. Monthly Vital Statistics. Vol. 39. No. 4. Supplement August 1990.

U.S. Department of Health and Human Services. National Center for Health Statistics. Advance Report of Final Natality Statistics. 1985. Monthly Vital Statistics. Vol. 36. No. 4. Supplement July 1987.

U.S. Department of Health and Human Services. National Center for Health Statistics. Unpublished data based on Advanced Report of Final Natality Statistics, 1982. Monthly Vital Statistics. Vol. 33. No. 6. September 1984.

Medicaid

U.S. Department of Health and Human Services. Health Care Financing Administration.

Number of Related Children under Age 21 Below the Poverty Line: Computed by the Congressional Research Service, based on Current Population Survey of the U.S. Bureau of the Census; 1988-89 data only computed by U.S. Bureau of the Census.

Childhood Immunization

U.S. Department of Health and Human Services. Centers for Disease Control.

U.S. Department of Commerce. Bureau of the Census Statistical Abstract of the United States: 1985, Table 181; and 1987, Table 162.

Preschool Education

U.S. Department of Health and Human Services. Head Start Bureau.

U.S. Department of Commerce. Bureau of the Census.

U.S. Department of Commerce. Bureau of the Census. Statistical Abstract of the United States: 1987, Table 194; 1985, Table 212.

Reece, C. "Head Start at 20." Children Today. V. 14. No. 2. March-April 1985.

Compensatory Education

U.S. Department of Education. Chapter 1 and Related Programs Division.

Estimated number of children in need of services: Computed by the Congressional Research Service, based on allocation formula for Chapter 1 funding and Current Population Survey of the U.S. Bureau of the Census.

U.S. Department of Education. Office of Educational Research and Improvement. National Assessment of Chapter 1.

Children's Defense Fund. A Children's Defense Budget.

Children's Defense Fund. An Interim Report on the Implementation of Chapter 1. Washington, DC. 1984.

Education for All Handicapped Children

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Twelfth Annual Report to Congress on the Implementation of the Education of the Handicapped Act 1990.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Eleventh Annual Report to Congress on the Implementation of the Education of the Handicapped Act. 1989.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Ninth Annual Report to Congress on the Implementation of the Education of the Handicapped Act. 1987.

U.S. Department of Education. Office of Special Education and Rehabilitative Services. Seventh Annual Report to Congress on the Implementation of the Education of the Handicapped Act. 1985.

Kakalik, J., et al. Service for Handicapped Youth: A Program Overview. Santa Monica, California: Rand Corporation. 1973.

Youth Employment and Training

U.S. Department of Labor. Employment and Training Administration.

U.S. Department of Labor. Bureau of Labor Statistics.

Lead Screening

Miller, C.A., et al. Monitoring Children's Health: Key Indicators. 2nd edition. American Public Health Association. Washington, DC. 1989.

Childhood Injury Prevention

Baker, S.P. and Waller, A.E. Childhood Injury: State-By-State Mortality Facts. The Johns Hopkins Injury Prevention Center. Baltimore, Maryland. January, 1989.

Rodriguez, J.G. and Brown, S.T. "Childhood Injuries in the United States." American Journal of Diseases of Children. Vol. 144. June 1990.

Smoking Cessation

U.S. Department of Health and Human Services. The Health Benefits of Smoking Cessation. Report of the Surgeon General. 1990.

U.S. Department of Health and Human Services. Reducing the Health Consequences of Smoking. Report of the Surgeon General. 1989.

Windsor, R. The Handbook to Plan, Implement, and Evaluate Smoking Cessation Progams for Pregnant Women. March of Dimes Birth Defects Foundation. (In Press)

Home Visiting

U.S. General Accounting Office. Home Visiting. A Promising Early Intervention Strategy for At-Risk Families. GAO/HRD-90-83. July 1990.

OPPORTUNITIES FOR SUCCESS: COST EFFECTIVE PROGRAMS FOR CHILDREN UPDATE, 1990

Republican Additional Views

While we agree that some of the services described by this Report are vital to the health and development of our nation's children, we do not believe that the Report represents an adequate or comprehensive evaluation of the programs or the role of the federal government in providing these services. We want to make it clear that by adopting this Report, we do not relinquish our right or obligation to critically examine how these programs are administered.

Given today's fiscal crisis, we should be more demanding, more exacting of the programs funded by the federal government in order to make logical, reasoned, rational, and judicious choices about them. What is needed today is a report which would assist the Congress in setting budget priorities by making evaluations and comparisons across all 125 programs which serve children and their families and about how programs are administered. In this respect, the third edition of *Opportunities for Success: Cost Effective Programs for Children* is, quite frankly, a disappointment.

It was rather predictable that this Report would come up short once again. In its 1988 response to Republican members of the Select Committee, the General Accounting Office (GAO) developed an evaluation "framework" for properly assessing a program's value. GAO noted that:

> While there are, to date, many sources of sound guidance on the technical aspects of evaluating a program, there are no broad frameworks readily available to help ensure that a fair--comprehensive and balanced--assessment will be made. Thus, up to now, the risk exists that valuation of a program will be flawed because of insufficient attention to what criteria are used to judge a program's worth.

We believe that this observation applies to today's Report as well. Using GAO's framework, a comprehensive evaluation should include 10 general criteria in a three-part structure as follows:

Class	Criteria
Need for the Program	Problem Magnitude Problem Seriousness Duplication
Implementation of the Program	Interrelationships Program Fidelity Administrative Efficiency
Effects of the Program	Targeting Success Achievement of Objectives Cost-Effectiveness Other Effects

Instead of a comprehensive evaluation, we are cajoled into settling for a discomfiting array of disconnected programs. Some of the "programs" are not really programs, they are services. There is no assessment as to the optimal role of federal, state, and local government involvement. We are sometimes asked to indulge in assumptions rather than proven success. And, despite the title of the Report, it is not a cost-benefit analysis of these programs.

This Report is an unfortunate reflection of the policy-making process itself. It oversimplifies findings, blurs critical distinctions, and most of all, fails to inform us as to **why** a program is effective. We believe that proven success stories are being used to provide cover for weaker ones. But our principle objection is that because of the misplaced emotional attachment to **programs** rather than **services** and because of the powerful interest groups which entwine themselves around these programs, a perception that the **administration** of these programs cannot be questioned is reinforced. More than ever, we Republicans intend to challenge the wasteful bureaucracy which consumes many of the resources meant to serve people. We believe that the manner in which separate categorical programs are administered is itself a barrier to service as well as inefficient and ineffective.

Lamentably, this Report is a goal-line defense of the programmatic status quo. It fails to objectively identify the deficiencies of the programs as they relate to the overall social welfare system. For example, a 1986 study for the U. S. Department of Health and Human Services recommended that Maternal and Child Health (MCH) and the Special Supplemental Food Program for Women, Infants, and Children (WIC) services be co-located at the local services delivery level "so that clients can receive integrated and comprehensive services." However, this recommendation has been virtually ignored by Congress.

The study also cited a 1982 Institute of Medicine critique of public health services which found that:

> [O]fficials sometimes will tend to protect themselves through narrow interpretation of the rules and tend not to take risks for purposes of broader program integration. Moreover, existing reward systems discourage action and risk taking toward the objective of coordination. Several State officials expressed the opinion that there is little encouragement from Federal or Regional officials to develop creative mechanisms for coordinating services while streamlining accounting and reporting systems, and that the additional costs incurred in developing coordinated systems are borne by State and local government.

This quotation lies at the very heart of our disappointment in the Report. For the third time, the Report has failed to embrace the opportunity to offer corrective alternatives to the deficiencies in the social welfare system. Those deficiencies begin with the very perspective about how government programs are organized. The Report has failed to look at the effectiveness of programs as part of a comprehensive system. The growth in the number of programs makes it more difficult to evaluate program performance and creates new problems in choosing among alternatives. In a nutshell, this is the root of our budget problems. Instead of making choices, we just add another program.

The programs described in this Report and the bureaucracy which maintains them have followed the scientific management model. Whether intentional or not, the federal government has tried to manufacture healthy children by using the same management model as it used to build bombers in World War II. That is, it broke the service system down into separate categorical programs among program specialists--social workers, dietitians, family planning counselors, prenatal care providers, etc. After decades of experimentation, it is clear that this management theory has simply not worked in the human services field. Programs have been designed to serve a problem rather than a person.

There are a number of problems in this approach when applied to human services. **First, it creates competition for resources.** Although this is a good idea on the assembly line, it is counterproductive in such areas as maternal and child health. At best, the mixed game strategy resembles "prisoners' dilemma" which requires the participants to independently make a choice for the common good in order to gain an advantage in the end. But if one party fails to cooperate, everyone loses.

Second, it is terribly wasteful. Each categorical program has generated its own set of bureaucratic demands to satisfy. While Washington is engaged in power politics, resources which could be used to serve clients are wasted on administrative costs. The Select Committee on Children, Youth, and Families visited a clinic in Connecticut last December which juggles 17 different federal, state, and local assistance programs. In a minority staff survey on the availability of maternal and child health services, we found that 88 percent of providers receive support from more than one funding source. Seventy-seven percent receive funding from three or more sources. Multiple funding sources means that there are multiple guidelines and reporting requirements as well as unpredictable fluctuations in funding amounts.

Third, it depends on the client to assemble the parts. This often creates new artificial barriers. For example, why is transportation a medical issue? Because Congress has created a fragmented delivery system. The latest buzzword in health care, "case-management," is neither a new nor innovative idea. It is another band-aid to fix a problem created by the fragmented system. Reimbursement for case management costs about half of prenatal care itself.

Fourth, when you set up a system to "produce" something, you have to produce something that can be counted. It is very difficult, if not impossible, to prove cause and effect in a social services evaluation for the simple reason that so many variables must be considered. Thus, we tend to measure the process rather than what really matters, which is individual client outcomes. It is relatively easy to determine how well a program is performing, but are the **children** doing any better?

Because it has failed to control the human services "iron triangle," Congress is responsible for the lack of effectiveness in these programs. It is a tactical error to focus on performance standards for each of these programs individually, but that is what the categorical system forces administrative officials at all levels of government to do. We need a results-oriented approach to the problems of poverty and infant mortality.

Finally, the scientific management model assumes that there is someone overseeing the entire process and who is in charge of the final outcome. It is clear in the existing maternal and child health system that no one is really in charge of the major financial commitment to improve the lives and health of Americans. Last fall, the Assistant Secretary for Health testified that there are 93 programs administered by 20 different agencies related to the reduction of infant mortality. The services pregnant women and children need are really quite simple. But the administrative system has become so complex that no one is held accountable.

Although there are technical shortcomings with the Report, we will not dispute that the "research in this study relies on the best methodologies available." The paucity of rigorous evaluation speaks volumes about the Report. There are several examples in which testimony is passed off as research and there are confusing jumblings of separate programs together. For example, "Prenatal Care" is not a singularly identifiable federal **program**. It is, in fact, a collection of separate programs.

Opportunities for Success will no doubt be used at some later date to argue for program eligibility expansions and increased funding. Indeed, the not-so-subtle charts at the beginning of each section which depict the number of actual participants as only a fraction of those who should be served is a new feature to this edition. The underlying message of this Report is that "more" will be by definition "better." We do not believe that this Report can objectively shoulder such a burden from a technical perspective.

Congress should not deny the uncertainty which exists and simply declare the inevitability of desired results. Should we not question whether a program could be better administered? Should we not try to avoid the "false necessity" traps which often dominate funding debates? At what point does a program lose its unique role in promoting child development and become simply another subsidy program? Would a program's cost-effectiveness diminish if its benefits were no longer targeted? When there is emotional attachment to programs, objectivity is often lost.

Assumptions even about the most popular programs should not escape scrutiny. An example of our caution is found in the Special Supplemental Food Program for Women, Infants, and Children (WIC). The difference between the estimated number of eligible participants and the actual number of women, infants, and children who are receiving benefits is often used by advocates to call for a doubling of the WIC budget.

The Report only tells us that just 50 to 60 percent of those eligible received benefits. Women, infants, and children from families with income up to 185 percent of the federal poverty level may qualify for WIC. This means that in 1990, persons in a family of four with income up to $23,495 could qualify for WIC. Income, however, is not the only eligibility criterion. When national nutritional status was factored in, previous eligibility estimates which were based solely on income dropped by nearly

25 percent. We need to look more closely at who is receiving benefits, why others may not participate, and how improvements can be made.

- According to the U. S. Department of Agriculture's report, *Estimation of Eligibility for the WIC Program*, WIC benefits reached 72 percent of the higher-risk pregnant women and 88 percent of the higher-risk infants below 100 percent of poverty in 1984. Between 1984 and 1989, the number of women participating in WIC was increased by nearly 300,000, the number of infants increased by more than 425,000, and the number of children increased by 350,000. Do higher-risk individuals account for these increases? Why or why not?

- Nearly all of the cost-effectiveness evidence cited in *Opportunities for Success* is focused on improved birth outcomes. If further program expansions are not targeted toward high-risk pregnant women, will cost-effectiveness be diminished?

- The nutritional risk criteria are very broad. For children to be characterized as having adequate dietary intakes, they must have consumed 4 bread and cereal servings, 4 fruit and vegetable servings, 3 milk and dairy servings, and 2 meat and protein source servings in the previous 24 hours. Of those who currently do not receive benefits, what percentage are at risk determined from medically-based factors versus dietary-based factors?

- Twenty percent (an estimated $440 million in FY 1991) of the WIC budget is used for program administration and nutrition education. At least one-sixth of the total administrative budget must be spent on nutrition education. Has nutrition education been evaluated in respect to program outcomes? Can administrative costs be reduced through consolidation with related programs? Can client services be improved through integration?

Medicaid, which is now the largest single means-tested public assistance program, should not be immune from further analysis either. For example, at a Select Committee hearing last October on infant mortality, Dr. Ezra Davidson, a member of the Committee to Study Outreach for Prenatal Care, Institute of Medicine (IOM) and Professor and Chairman, Department of Obstetrics and Gynecology, King-Drew Medical Center, testified that:

> We learned that things are really terrible out there in regards to maternity health service. And they are so terrible that the congressional penchant for incremental changes will not fix this problem.
>
> Expanding Medicaid alone, adding home visiting alone, supporting nurse midwives alone, increasing reimbursement alone, nothing alone will solve the problems. **There must be major fundamental change in the ways we finance and deliver care for low-income women** (emphasis added).
>
> I think that ultimately the services must be organized and administered from the point of view of the pregnant patient.

Jonathan B. Kotch, M.D., M.P.H., Chair, Council on Maternal and Child Health, National Association for Public Health Policy, told the Committee that:

> In this brief testimony, I would like to offer a radical proposition, namely, that Medicaid is part of the problem, and not part of the solution. We will soon be "celebrating" the 25th anniversary of Medicaid, yet during that period, the status of the U. S. infant mortality rate relative to those of other developed nations of the world has declined. The availability of providers willing to accept indigent pregnant women has declined, while the number and proportion of Americans uninsured for medical expenses, particularly those Americans in their prime reproductive years, has gone up. Teenage parenthood and single parenthood, two risk factors associated with risk of low birthweight and infant mortality, have also gone up. These are evidence of system-wide failure, yet we continue to consider piecemeal solutions which only tinker at the margins, solutions which have failed at every step to keep up with the pace of

deteriorating circumstances among the weakest and most vulnerable of our population.

As an aside, the above quotations are from witnesses invited by the Majority.

Of course government shoulders a major role in providing prenatal care and nutritional services to reduce the infant mortality rate. But that reality should in no way be interpreted to mean blind devotion to a non-system which is failing to meet the expectations of beneficiaries and taxpayers alike. While we do not pretend that there is a consensus on how to make appropriate corrections, we ought not to pretend, as this Report does, that serious problems do not exist.

The Report is not an evaluation of the efficiency or the effectiveness of these programs or the child health and welfare system they comprise, though we wish it were. We hope that future reports will give serious attention to the evaluation of these programs as parts of an overall system. Should that indeed happen one day, we submit that it will change the way we look at poverty programs. It is clear that we must consider the broader implications of welfare on family formation and the moral development of children as well as the organizational structure and behavior of government.

(Signed)

THOMAS J. BLILEY, JR.
Ranking Minority Member
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BARBARA F. VUCANOVICH
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PETER SMITH
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Dissenting Views of Rep. Clyde C. Holloway
Select Committee on Children, Youth, and Families
October 22, 1990

CLYDE C. HOLLOWAY
8TH DISTRICT LOUISIANA

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Cotton, Rice, and Sugar
Forests, Family Farms, and Energy
Tobacco and Peanuts

COMMITTEE ON SMALL BUSINESS
SUBCOMMITTEES:
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Select Committee on Children,
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October 22, 1990

The Honorable George Miller
Chairman
Select Committee on Children,
Youth, and Families
H2-385 HOB Annex-2
Washington, D.C. 20515

Dear Chairman Miller:

In review of the Children, Youth, and Family Select Committee Report on "Opportunities for Success: Cost-Effective Programs for Children," I am not convinced the report accurately reflects the quality of these programs or the effectiveness of the federal government in implementing them.

I would like to underscore one critical point. The fundamental purpose of this and all related programs must be to improve the quality of the lives of those children the program was created to improve. We cannot allow the lion's share of the funding to be used to meet administrative overhead or for any other ancillary reasons. The purpose of such programs is not to create a paternal role for the federal government but rather to empower families with the means to care for themselves. The federal government should not attempt to replace the family but rather to strengthen and enhance it.

Finally, whether the program brings solely administrative jobs to the affected area or is popular among a small number of recipients, is also not the appropriate measure to determine whether the program has achieved its basic purpose.

It is imperative in the assessment of a program's success that we labor to answer one central question: Is the problem the program is purported to address getting any better as a result of having the program in place? and perhaps derivatively, has the federal government ever met a social program that it wouldn't fund? Not in recent memory.

Even in programs as successful as Headstart and Women, Infants, and Children, the problems these programs were designed to address exist in numbers far greater than the present figures would suggest. For example, there is something of a discrepancy in the Special Supplemental Food Program for Women, Infants, and Children. The numerical difference between the individuals who are eligible to receive assistance and the number of eligible individuals who actually receive assistance is significant. Yet, it is the former figure that is used by advocates to call for a doubling of the WIC budget.

Medicaid provides us with another example. This program was initiated to provide low-income families with dependent children and low-income aged, blind and disabled individuals with access to health care. To that end there has been an expanded eligibility for pregnant women to receive quality pre-natal care supposedly reducing the incidence of low-birthweight infants and infant mortality. Yet, have we been successful in this endeavor?

Jonathan B. Kotch, M.D., M.P.H., doesn't think so. He suggests that Medicaid is "part of the problem" rather than the solution. Citing only one example, Kotch maintains that teenage parenthood and single parenthood which are two major factors "associated with low birthweight and infant mortality, have gone up."

He contends that there are numerous examples of system inadequacy and "piecemeal" solutions which only superficially address the problems and have "failed at every step to keep up with the pace of deteriorating circumstances among the weakest and most vulnerable of our population."

There are other examples which could be called into question but I think what I have said will suffice. I do not mean to be disparaging but I truly believe that, given the fiscal crisis which now confronts this nation and the necessity of streamlining our budget, we should be very circumspect about our spending. This report should be primarily concerned with accurately apprising Congress of the success of these programs so that it is equipped to make the tough priority decisions that will have to be made.

I think it would be prudent for us to concentrate our resources more definitively on specific programs, and do so successfully, rather than trying to be all things to every program. Are we really to assume, for example, that the Headstart program and a program regarding smoking cessation are of equal worth in the lives of children? If this distinction is not made the implication is that every program is of equal importance and should be fully funded and expanded.

I have no problem with a well targeted program for the poor. But the assumptions and conclusions of this report are somewhat misleading. Significant improvements clearly need to be made and an accurately documented and truly representative assessment of these programs is one of them. I respectfully dissent from the majority opinion.

Sincerely,

CLYDE C. HOLLOWAY
Member of Congress

CCH:rra